CHATTANOOGA-HAMILTON COUNTY
AIR POLLUTION CONTROL BOARD
2018 COE Petition

Attachment – EPA Audits

Kathy Robertson <krobertson@chattanooga.gov>

Fwd: FW: File review findings - Chattanooga SRF

1 message

Alan Frazier <afrazier@chattanooga.gov> Thu, Jan 25, 2018 at 9:52 AM
To: Kathy Robertson <krobertson@chattanooga.gov>

---------- Forwarded message ----------
From: **Fite, Mark** <Fite.Mark@epa.gov>
Date: Thu, Jan 25, 2018 at 8:52 AM
Subject: FW: File review findings - Chattanooga SRF
To: "afrazier@chattanooga.gov" <afrazier@chattanooga.gov>, Cynthia McDaniel <cmcdaniel@chattanooga.gov>

FYI....

Mark J. Fite
Technical Authority for CAA, TSCA, FIFRA, & EPCRA
Office of Enforcement Coordination
U.S. EPA Region 4
61 Forsyth St., SW
Atlanta, GA 30303

fite.mark@epa.gov
404.562.9740

From: Fite, Mark
Sent: Wednesday, January 24, 2018 5:06 PM
To: Bob Colby - Chattanooga Hamilton County (bcolby@chattanooga.gov) <bcolby@chattanooga.gov>
Cc: Gordon, J. Scott <Gordon.Scott@epa.gov>; Spagg, Beverly <Spagg.Beverly@epa.gov>; Todd Russo <Russo.Todd@epa.gov>; Gala, Chetan <Gala.Chetan@epa.gov>
Subject: File review findings - Chattanooga SRF

Bob,

Happy new year! I've attached the file review spreadsheet documenting the observations we made during our visit in November. Please look these over and advise of any comments or feedback. We want to ensure we agree on the factual observations as we prepare the draft report. Be aware that there are three "tabs" to the spreadsheet. The facility-specific observations are in the 3rd tab.

Please feel free to call if you have questions.

Thanks!

Mark J. Fite
Technical Authority for CAA, TSCA, FIFRA, & EPCRA
Office of Enforcement Coordination
U.S. EPA Region 4
61 Forsyth St., SW
Atlanta, GA 30303

fite.mark@epa.gov
404.562.9740

CAA file review spreadsheet Chattanooga Round 3.xlsx
39K

SRF Round 3: CAA Facility-Specific Comments

State: Hamilton County, TN

#	Facility Name	Facility ID	General comments	Review of FY 2016 Activity: 2b comments	5a comments	5b comments	7a comments	8c comments	9a comments	10a comments	10b comments	14 comments	11a comments	12a comments	12b comments
1	ASTEC INDUSTRIES INC	TNCHC0004706500122	No issues.												
2	CHATTANOOGA CITY OF SUMMIT LANDFILL	TNCHC0004706505525					Two FRVs identified in the files, but no NOVs issued, and FRVs not entered in ICIS-Air: 1) late semi-annual report (51 days late) - "warning NOV" recommended, 2) flare operational problems (low temp, low flow rate), resulting in 1795 hours of violative operation in 2016 - NOV recommended; County advises source took corrective action by adding/supplementing flare with natural gas.	Combustion temperature of flare too low, which is an NSPS WWW operational requirement that lasted more than 7 days. Should have been identified as an HPV as well as FRV.							
3	CHATTANOOGA GAS COMPANY	TNCHC0004706500498		Applicable MACT air program and subpart (ZZZZ) missing from ICIS-Air. File reviewer also noted that an FY15 inspection report reported in ECHO (10/23/14) was not in the files. This is noted, but outside the review year.											
4	CITY OF CHATTANOOGA LANDFILL	TNCHC0004706506027		Applicable MACT air program and subpart (ZZZZ) missing from ICIS-Air. NSPS IIII also missing from ICIS-Air.			FRV identified in the FCE report but not entered in ICIS-Air: late semi-annual report (51 days late).								
5	CITY OF CHATTANOOGA MOCCASIN BEND TREATM	TNCHC0004706505745	No issues.												
6	ERGON TERMINALING, INC.	TNCHC0004706504040		Note minor discrepancy: FCE recorded as 10/13/15 in file, but report is dated 10/12/15.											
7	INVISTA S.A R.L., LLC	TNCHC0004706502730	Supplemental: The county conducted an inspection of the Invista facility on 8/18/16, but elected not to finalize an FCE for FY16 because of the company's planned sale and transfer of certain facility assets to Kordsa. Invista operations ceased May 31, 2017.												
8	KORDSA, INC.	TNCHC0004706506132	Supplemental: The county conducted an inspection of the Kordsa facility on 8/17/16, but elected not to finalize an FCE for FY16 because of the Invista's planned sale and transfer of certain facility assets to Kordsa. Kordsa dropped from a Major to SM permit.												
9	LECTRUS CORPORATION	TNCHC0004706501070	No issues.												
10	MUELLER CO. LLC	TNCHC0004706502150	Supplemental: Source selected due to HPV and enforcement action taken in FY17.										No penalty calculation in file, so no gravity and/or economic consideration documented.	County advises that there was no change in penalty, but this is not clearly documented in the file, since initial and final penalty calculations were not generated.	
11	PILGRIM'S PRIDE CORPORATION - FEED MILL	TNCHC0004706505270	No issues.												
12	PLASTIC OMNIUM AUTO EXTERIORS, LLC	TNCHC0004706506159	No issues.												
13	PORTER WARNER INDUSTRIES, LLC	TNCHC0004706504240	No issues.												
14	SEQUATCHIE CONCRETE SERVICE, INC (1)	TNCHC0004706501335	No issues.												
15	SOFIX CORPORATION	TNCHC0004706503345	No issues.												
16	SPHERE ONE, INC.	TNCHC0004706505035	No issues.												
17	STEWARD ADVANCED MATERIALS, INC.	TNCHC0004706500760		Date of FCE differs (10/22/15 in ICIS, 10/26/15 in report); NAICS differs (ICIS - 331112, file 327993); address differs (1245 East 36th St in ICIS, East 36th St and Jerome in FCE reports)											
18	VINCENT PRINTING CO., INC.	TNCHC0004706505805	No issues.												
19	VOLKSWAGEN GROUP OF AMERICA CHATTANOOGA	TNCHC0004706506125					Inspection report indicates pressure drop records incomplete or missing, and termocoupling calibration (RTO) was delayed by 17 days. The report does not provide additional information, so these are potentially FRVs.								
20	WESTROCK CONVERTING COMPANY - PAPERBOARD MILL	TNCHC0004706503455	No issues.												

SRF Round 3: CAA File Metric Calculation

State: Hamilton County, TN | **Date of On-Site Review: 11/1-3/2017** | **Review of FY 2016 Activity**

#	Facility Name	Facility ID	2b	6a	6b	7a	8c	9a	10a	10b	14	11a	12a	12b
			Accurate MDR data in AFS	Documentation of FCE elements	Accurate compliance determinations documentation to determine compliance	Accurate HPV determinations	Formal enforcement that returns facilities to compliance	Timeliness of addressing HPVs having a CD&RT in place	Appropriate enforcement responses for HPVs or alternately elements	HPV CD&RT in place contains required policy	Gravity and economic benefit	Documenting difference between initial and final penalty	Penalties collected	
1	ASTEC INDUSTRIES INC	TNCHC0004706500122	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	CHATTANOOGA CITY OF SUMMIT LANDFILL	TNCHC0004706505525	Y	Y	Y	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	CHATTANOOGA GAS COMPANY	TNCHC0004706500498	N	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	CITY OF CHATTANOOGA LANDFILL	TNCHC0004706506027	N	Y	Y	N	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	CITY OF CHATTANOOGA MOCCASIN BEND TREATM	TNCHC0004706505745	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	ERGON TERMINALING, INC.	TNCHC0004706504040	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	INVISTA S.A R.L., LLC	TNCHC0004706502730	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	KORDSA, INC.	TNCHC0004706506132	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9	LECTRUS CORPORATION	TNCHC0004706501070	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	MUELLER CO. LLC	TNCHC0004706502150	Y	Y	Y	Y	Y	Y	Y	Y	N/A	N	N	Y
11	PILGRIM'S PRIDE CORPORATION - FEED MILL	TNCHC0004706505270	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	PLASTIC OMNIUM AUTO EXTERIORS, LLC	TNCHC0004706506159	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13	PORTER WARNER INDUSTRIES, LLC	TNCHC0004706504240	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14	SEQUATCHIE CONCRETE SERVICE, INC (1)	TNCHC0004706501335	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15	SOFIX CORPORATION	TNCHC0004706505345	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16	SPHERE ONE, INC.	TNCHC0004706505035	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17	STEWARD ADVANCED MATERIALS, INC.	TNCHC0004706500780	N	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	VINCENT PRINTING CO., INC.	TNCHC0004706505805	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	VOLKSWAGEN GROUP OF AMERICA CHATTANOOGA	TNCHC0004706506125	Y	Y	Y	N	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	WESTROCK CONVERTING COMPANY - PAPERBOARD MILL	TNCHC0004706503455	Y	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Yes Responses (Numerator)			**17**	**18**	**18**	**15**	**3**	**1**	**1**	**1**	**0**	**0**	**0**	**1**
Total Responses (Denominator)			**20**	**18**	**18**	**18**	**4**	**1**	**1**	**1**	**0**	**1**	**1**	**1**
Percentage			**85.0%**	**100.0%**	**100.0%**	**83.3%**	**75.0%**	**100.0%**	**100.0%**	**100.0%**	**#DIV/0!**	**0.0%**	**0.0%**	**100.0%**

SRF Round 3: CAA File Metric Initial Findings

State: Hamilton County, TN

Review of FY 2016 Activity

CAA Metric #	CAA File Review Metric Description	Numerator	Denominator	Percentage	Goal	Initial Findings	Details
	ELEMENT 1: DATA						
2b	Accurate MDR data in AFS	17	20	85.0%	100%	Area for State Attention	
	ELEMENT 2: INSPECTIONS						
6a	Documentation of FCE elements	18	18	100.0%	100%	Meets or Exceeds Requirements	
6b	Compliance monitoring reports (CMRs) or facility files reviewed that provide sufficient documentation to determine compliance of the facility	18	18	100.0%	100%	Meets or Exceeds Requirements	
	ELEMENT 3: VIOLATIONS						
7a	Accurate compliance determinations	15	18	83.3%	100%	Area for State Attention	
8c	Accurate HPV determinations	3	4	75.0%	100%	Area for State Improvement	
	ELEMENT 4: ENFORCEMENT						
9a	Formal enforcement responses that include required corrective action that will return the facility to compliance in a specified time frame	1	1	100.0%	100%	Meets or Exceeds Requirements	
10a	Timeliness of addressing HPVs or alternatively having a case development and resolution timeline in place.	1	1	100.0%	100%	Meets or Exceeds Requirements	
10b	Appropriate enforcement responses for HPVs	1	1	100.0%	100%	Meets or Exceeds Requirements	
14	HPV Case Development and Resolution Timeline (CD&RT) contains required policy elements	0	0	#DIV/0!	100%		
	ELEMENT 5: PENALTIES						
11a	Penalty calculations reviewed that document gravity and economic benefit	0	1	0.0%	100%	Area for State Improvement	
12a	Documentation of rationale for difference between initial penalty calculation and final penalty	0	1	0.0%	100%	Area for State Improvement	
12b	Penalties collected	1	1	100.0%	100%	Meets or Exceeds Requirements	

Finding Category Descriptions

Meets or Exceeds Expectations: The SRF was established to define a base level or floor for enforcement program performance. This rating describes a situation where the

Area for State Attention: An activity, process, or policy that one or more SRF metrics show as a minor problem. Where appropriate, the state should correct the issue without

Area for State Improvement: An activity, process, or policy that one or more SRF metrics show as a significant problem that the agency is required to address.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4

Science and Ecosystem Support Division
Enforcement and Investigations Branch
980 College Station Road
Athens, Georgia 30605-2720

June 2, 2017

Mr. Robert Colby
Chattanooga Hamilton County Air Pollution Control Bureau
6125 Preservation Drive
Chattanooga, Tennessee 37416

SESD Project #: 16-0004

Dear Mr. Colby:

This letter is to forward to you the final report for the Technical Systems Audit conducted October 1-2, 2015, by U.S. Environmental Protection Agency, Region 4, on the Chattanooga Hamilton County Air Pollution Control Bureau's ambient air monitoring program. Because there were no findings or concerns identified during your TSA, we are able to close out your audit at this time as well.

We commend your program for the effort you put forth to collect quality ambient air monitoring data. I appreciate your agency's participation in the TSA, as well as the assistance of your staff to address the issues that were identified. SESD has finalized this TSA in the EPA Air Quality System (AQS) database, entering the date of this letter as the official closed-out date. If you have any questions regarding the audit, please contact Richard Guillot at (706) 355-8737.

Sincerely,

Laura Ackerman, Chief,
Superfund and Air Section

cc: Gregg Worley, APTMD

United States Environmental Protection Agency
Region 4
Science and Ecosystem Support Division
980 College Station Road
Athens, Georgia 30605-2720

2016 Ambient Air Monitoring Technical Systems Audit Report

Chattanooga Hamilton County Air Pollution Control Bureau
Chattanooga, Tennessee
November 2-5, 2015

SESD Project Identification Number: 16-0004

SESD Project Leader: Richard Guillot
U.S. EPA Region 4, SESD / FSB
980 College Station Road
Athens, Georgia 30605-2720

Title and Approval Sheet

TITLE: **2016 Ambient Air Monitoring Technical Systems Audit Report: Chattanooga Hamilton County Air Pollution Control Bureau**

FINAL REPORT

Approving Official:

Laura Ackerman, Chief
Superfund and Air Section
Field Services Branch

06 / 02 / 2017
Date

SESD Project Leader:

Richard Guillot, Environmental Engineer
Superfund and Air Section
Field Services Branch

06 / 02 / 2017
Date

Table of Contents

1. Executive Summary

The Chattanooga Hamilton County Air Pollution Control Bureau collects quality data in accordance with EPA regulations and approved quality system documentation. The staff are well trained in the operation of the instrumentation and are knowledgeable regarding good quality assurance practices. The monitoring sites are well maintained and the documentation and records were in order and readily available. The report contains no findings requiring corrective action by the CHCAPCB.

During the exit briefing the CHCAPCB expressed the need for additional funding for the purchase of a new vehicle for program operations. The possible availability of funding was discussed due to another agency declining its §105 Grant for 2016. This request was communicated to EPA Region 4's Air Pesticides and Toxic Management Division (ATPMD).

2. Introduction

A Technical Systems Audit (TSA) was conducted November 2-5, 2015, per 40 CFR Part 58, Appendix A, §2.5, on the Chattanooga Hamilton County Air Pollution Control Bureau's (CHCAPCB) ambient air monitoring program. The purpose of this audit was to assess CHCAPCB's compliance with established regulations governing the collection, analysis, validation, and reporting of ambient air quality data. The CHCAPCB has established itself as a primary quality assurance organization (PQAO). As a PQAO, the CHCAPCB has created and submitted for approval a quality assurance project plan (QAPP) and standard operating procedures (SOPs).

A TSA is required a minimum of every 3 years as specified in 40 CFR Part 58 Appendix A § 2.5. Data were queried from EPA's Air Quality System (AQS) database prior to the on-site audit. Information reviewed for this TSA included the 2013-2015 monitoring years. In addition, the National Ambient Air Monitoring Technical System Audit Form was completed by CHCAPCB monitoring personnel prior to the onsite audit and is included in Appendix A at the end of this report.

The TSA was conducted at the CHCAPCB facility located at 6125 Preservation Drive, in Chattanooga, Tennessee. EPA Region 4's Science & Ecosystem Support Division (SESD) audit team included Keith Harris and Richard Guillot.

The CHCAPCB personnel interviewed during the audit included:

Robert H. Colby, Director
Kathy Jones, Air Monitoring Manager
Jim Long, Instrument Technician

The following CHCAPCB quality systems documents were reviewed prior to and during the TSA, as well as the Appendix A questionnaire.

Quality Assurance Project Plan Chattanooga-Hamilton County Air Pollution Control Bureau; March 30, 2007.

Standard Operating Procedures, Ozone Monitoring Sites, Ozone Monitors TEI 49CPS, 49C, 49iPS, 49i, ESC 8816, and 8832 Data Loggers, MTek 2801 Strip Chart Recorders; Rev 13, Nov 20, 2014, Jan 16&20, 2015, Sep 21, 2015.

Standard Operating Procedure, Thermo Environmental, Inc. /R&P, Tapered Element Oscillating Microbalance (TEOM), Rev 1, Aug 29, 2014.

Standard Operation Procedure, Data Handling, Rev 5, 10/2/2015.

Standard Operating Procedure, $PM_{2.5}$ Site Operation, Rev 1, Jul 14, 2014.

Standard Operating Procedure, Ozone Calibrator Certification, TEI 49iPS & 49CPS against SESD Athens NIST traceable SRP-10, Sep 18, 2014.

Standard Operating Procedure, Graseby / Anderson General Metal Works, PM_{10} High Volume Collocated Monitors, Rev 1, Aug 20, 2014.

The following AQS reports were polled and reviewed prior to and during the TSA:

AMP 251	QA Raw Assessment Report	2013-2015
AMP 256	QA Data Quality Indicator Report	2013-2015
AMP 260	Reduced Frequency Distribution Report	2013-2015
AMP 300	Violation Day Count	2013-2015
AMP 350	Raw Data Report	2013-2015
AMP 350NW	Raw Data – NAAQS Averages	2013-2015
AMP 360	Raw Data Qualifier Report	2013-2015
AMP 380	Site Description Report	2013-2015
AMP 390	Monitor Description Report	2013-2015
AMP 395	Monitor Audit List	2013-2015
AMP 430	Data Completeness Report	2013-2015
AMP 440	Maximum Values Report	2013-2015
AMP 450	Quicklook Criteria Parameters	2013-2015
AMP 450NC	Quicklook All Parameters	2013-2015
AMP 480	Design Value Report	2013-2015
AMP 503	Extract Sample Blank Data	2013-2015
AMP 504	Extract QA Data	2013-2015
AMP 600	Certification Evaluation and Concurrence	2013-2015

EPA auditors visited each of the active monitoring sites during the TSA, the discontinued PM_{10} monitoring sites were not reviewed. The following monitoring sites and facilities were visited by EPA during this TSA:

Soddy Daisy High School	(AQS #47-065-1011)	- Ozone (O_3), $PM_{2.5}$
Tombras Ave, East Ridge	(AQS #47-065-0031)	- $PM_{2.5}$
Siskin Drive, UTC	(AQS #47-065-4002)	- $PM_{2.5}$ Collocated, $PM_{2.5}$ Continuous
Eastside Utility	(AQS #47-065-4003)	- O_3

3. Findings and Corrective Action Recommendations

The observations from this TSA were compared to EPA regulations, guidance, and the CHCAPCB quality system documentation.

Quality system deviations found through this TSA are classified into three categories: findings, concerns, and observations. These quality system deviations are defined as follows:

Finding:	Departure from or absence of a specified requirement (regulatory, QMP, QAPP, SOP, etc.) or significant guidance deviation. .
Concern:	Practices thought to have potential detrimental effect on the ambient air monitoring program's operational effectiveness or the quality of sampling or measurement results.
Observation:	An infrequent deviation, error, or omission which does not impact the output of the quality of the work product but may impact the record for future reference.

For each of these categories, corrective action recommendations are provided. For those quality system deviations that are ranked as findings, depending on the severity of the finding, a data deliverable may be requested to show that the corrective action recommendation has been successfully implemented. In these cases, the TSA report will state the "Data Deliverables" that will be required for AQS and/or submitted to EPA Region 4 SESD to address the findings and recommendations.

3.1 FIELD OPERATIONS

3.1.1 Concern: The $PM_{2.5}$ WINS impactors and PM_{10} separator head assembly are not cleaned on the EPA recommended schedule.

Discussion: An inspection of the WINS impactors and PM_{10} separator head assemblies was conducted during the monitoring site visits. The auditors noted the condition of the equipment and discovered the CHCAPCB standard operating procedures vary from the EPA recommended schedule. According to Method 2.12 Section 3.31 and 9.3 respectively, the WINS impactors be cleaned after every 5^{th} sample and the PM_{10} head be cleaned monthly. Current CHCAPCB procedures allow for the WINS impactor to be cleaned monthly and the PM_{10} head annually. The buildup of debris over these time frames could cause a deviation in the separation cut points.

Recommendation(s): EPA recommends the CHCAPCB modify its procedures to match EPA guidance.

3.2 LABORATORY OPERATIONS

The CHCAPCB utilizes the Inter-Mountain Labs (IML) for the analytical analysis (filter weighing) in its $PM_{2.5}$ monitoring network. IML has updated its data package to the CHCAPCB to allow for validation of the $PM_{2.5}$ dataset. Since CHCAPCB has terminated its PM_{10} monitoring network they no longer operate a PM_{10} filter weighing lab.

3.3 DATA MANAGEMENT

CHCAPCB records for standard certifications /verifications were reviewed for this TSA. All certificates reviewed were within the timeframe specified in regulation (no expired standards were found). This documentation was readily available upon request to the auditors. This indicates the CHCAPCB is organized and is properly scheduling the tasks necessary to maintain quality data.

3.4 QUALITY ASSURANCE

The review of the AQS reports identified in §2 above indicated CHCAPCB collects data meeting EPA requirements for data recovery and quality. Logbook documentation was readily available and sufficient description information was found when anomalous data points, QA actions and subsequent AQS data coding were investigated. Quality Assurance documentation was up-to-date in response to the last TSA conducted in FY 2013.

CHCAPCB conducts audits of its monitoring network in addition to the audits conducted by State of Tennessee. These audits are required under 40 CFR Part 58, Appendix A. The audit equipment used by CHCAPCB is independent of the calibration and precision check equipment used during routine data collection. These audits and the requirement for independent equipment is found in 40 CFR Part 58, Appendix A.

3.4.1 Observation: CHCAPCB should coordinate with the State of Tennessee audit personnel to ensure the audit ranges and parameters in use by the State meet the requirements of the CHCAPCB quality system.

Discussion: The CHCAPCB is an independent primary quality assurance organization (PQAO) from the State of Tennessee. The audit parameters and ranges in use by state audit personnel may not match the quality system requirements of the CHCAPCB.

Recommendations: The CHCAPCB should coordinate with the State of Tennessee audit personnel to ensure the audits meet the requirements of the CHCAPCB quality system.

4. Conclusions

The Chattanooga Hamilton County Air Pollution Control Bureau is collecting quality data suitable for regulatory decision making. The technical system audit did not reveal any issues that would rank as a finding for this report. The concerns and observations noted in the report do not require a formal response but are provided for consideration by the agency.

Appendix A

National Ambient Air Monitoring Technical System Audit Form

APPENDIX 1

United States
Environmental Protection Agency
Region 4

Science & Ecosystem Support Division
980 College Station Road
Athens, Georgia 30605

Ambient Air Monitoring
Technical System Audit Form

November 2, 2015

Table of Contents

1) GENERAL INFORMATION

a) Program Organization

Organization Name: *Chattanooga Hamilton County Air Pollution Control Bureau*

Address: *6125 Preservation Drive*
City, State, and Zip Code: *Chattanooga, Tennessee 37416*

Phone: *423-643-5980 Direct KJ* *423-643-5970 Main*

Agency Director: *Robert H. Colby*

Ambient Air Monitoring (AAM) Network Manager: *Kathy Jones*

Quality Assurance Manager: *Kathy Jones*

QA Auditors: *Richard Guillot, Keith Harris, Sara Waterson*

Field Operations Supervisor / Lead: *Kathy Jones*

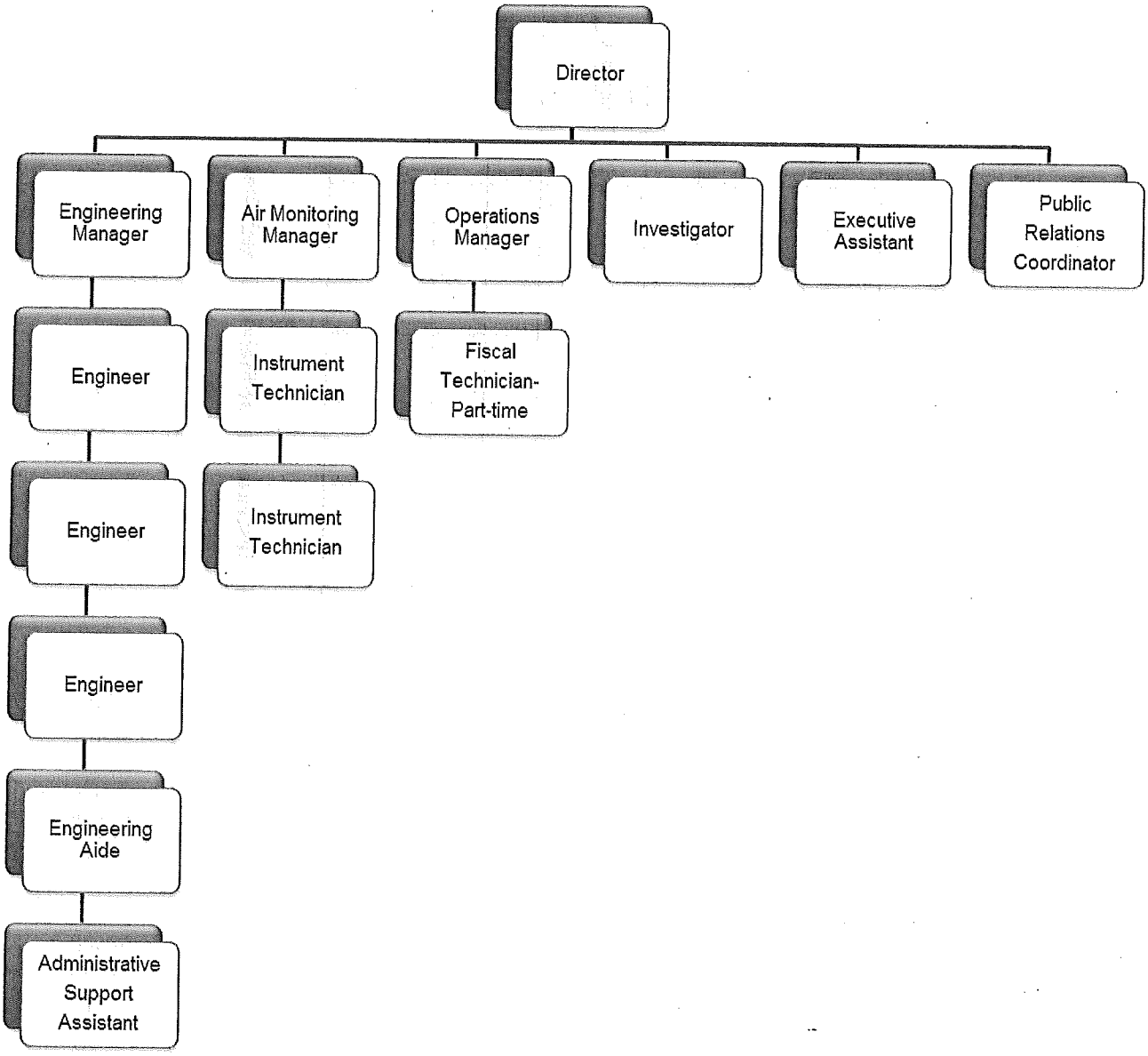
Laboratory Supervisor: *Kathy Jones at CHCAPCB/Mary Hininger at IML*

QA Laboratory Manager: *Kathy Jones at CHCAPCB/Mary Hininger at IML*

Data Management Supervisor / Lead: *Kathy Jones*

AQS Submitter: *Kathy Jones, Jim Long, Steve Langston*

Insert an Organizational Chart (or provide a hard copy during the audit):



b) Personnel

List available personnel and select their primary duties:								
Name	Network Design and Siting	QC Activities	QA Activities	Equipment Repair & Maintenance	Data & Data Management	Financial Management	Site Operation (PM, Gaseous, Met)	Other Non-Ambient Air Monitoring Duties
Kathy Jones	X	X	X		X	X		
Steve Langston				X	X		X- PM2.5	
Jim Long				X	X		X- Ozone 2.5 Continuous	

In your agency, are site operators responsible for running all of the instruments at their assigned sites, certain instruments (ex. O_3) at multiple sites, or a combination of the two?

Steve Langston operates the FRM $PM_{2.5}$ monitors, and Jim Long operates the two ozone sites and the continuous $PM_{2.5}$ monitor. They sub for each other.

List personnel who have authority or are responsible for:		
Activity	Name	Title
QA Training Field/Lab	Kathy Jones	Air Monitoring Manager
Grant Management	Kathy Jones	Air Monitoring Manager
Purchases Greater than $500	Kathy Jones/Bob Colby	Air Monitoring Manager/ Director
Equipment and Service Contract Management	Kathy Jones	Air Monitoring Manager
Staff Appointment	Kathy Jones	Air Monitoring Manager
Monitoring Operations	Kathy Jones	Air Monitoring Manager

Questions	Yes	No	Comments
Does your agency utilize any contractors in your air monitoring program? If no, skip to the next table.	X		InterMountain Laboratory (IML) of Sheridan Wyoming for $PM_{2.5}$ Weighing
Who is responsible for oversight of contract personnel?	Kathy Jones in Monitoring/ Joy Price in Operations		
What steps are taken to ensure contract personnel meet training and experience criteria?	We have used this contract lab exclusively for $PM_{2.5}$ weighing since 1999. We have worked with the current lab supervisor for about 9 years.		
Does the contractor follow an EPA approved QAPP?	X		EPA audited IML in 2014 so it is assumed EPA has reviewed their Lab QAPP.
- Where/how is this documented?	IML was audited in 2014 by EPA. Audit report is posted at www.epa.gov		
How often are contracts reviewed and/or renewed?	Every 5 years. Current contract is about 2 yrs old		

Comment on the need for additional personnel, if applicable:

Not needed.

List your district/regional offices and associated staff below (State Agencies Only)		
Name	Address	Staff

c) Training

Question	Yes	No	Comments
Does the agency have a training program and training plan?	X		A small agency does not have funding for external training for technicians. Our technicians are long time employees. If the technicians were new or there was new equipment for a new program, they would receive more training. Their only training now is to send them, if funds allow, to Region 4 Workshop or the National Air Monitoring Workshop or an EPA sponsored QA training class.
Where is it documented?	Notebook on lab bookshelf		
Does it make use of seminars, courses, and/or EPA sponsored courses?	X		When funds and personnel allow.
Are personnel cross-trained for other ambient air monitoring duties?	X		Technicians are cross -trained to run each position.
Are training funds specifically designated in the annual budget?	X		Training funds are limited. Since EPA cut both the 105 and 103 grant funds, travel can be cut to help meet grant funding reductions.
Does the Training Plan Include: 1. Training requirements by position	X		
2. Frequency of Training	X		
3. Training for contract personnel		X	IML is responsible for its own training.
4. A list of core QA related courses			

Indicate below the three most recent training events and identify the personnel participating in them:		
Event	Date(s)	Participant(s)
1. Region 4 Workshop	March 2015	Kathy Jones, Jim Long, Steve Langston
2. NASA: Remote Sensing	Sept 1-3, 2015	Kathy Jones

Regional QA Training	Feb 2015	Steve Langston, Jim Long in person, Kathy Jones attended two of the training sessions by webinar (last day was not included)- first session in Nashville and last in Montgomery. Jim Long also attended the Nashville session by webinar.

d) Facilities

Identify the principle facilities where the agency conducts work related to air monitoring. Do not include monitoring stations, but include facilities where work is performed by contractors or other organizations. Select which purpose(s) each facility serves. Add additional lines as necessary

Facility Address	General Office Space	Data Verification and Processing	Criteria Gas Instrument Maintenance and Storage	Standards Certification / Calibration	PM Filter Weighing	Records Storage	Air Toxics Maintenance and Storage	Air Toxics Laboratory
6125 Preservation Drive	X	X	N/A	X	N/A	X	N/A	N/A

Are monitoring sites ever used for storage of equipment, spare parts or supplies? *Storage items have been moved to a newly provided storage room. We have left 49C backup monitors at each ozone site so that they can be placed into operation on short notice.*

-

Identify any facilities that should be upgraded. Identify by function and any suggested improvements or recommendations. *Facilities are adequate.*

-

Are facilities adequate concerning safety? If not, please explain and give suggested improvements or recommendations.

- *Facilities are adequate concerning safety.*

Are there any significant changes likely to be implemented to agency facilities within the next three years? *No*		
Facility	Function	Proposed Change - Date

Comment on the agency's need for additional physical space (laboratory, office, storage, etc.)

- *Do not need additional space.*

2) QUALITY MANAGEMENT

a) Quality Assurance and Quality Control

i) Status of Quality Assurance Program

QA activities are performed and supported by sources uniquely different from those used in routine QC activities. Independent / dedicated equipment, different personnel and calibration methodologies are purposely used in performing QA audits, performance checks, etc.

Question	Yes	No	Comments
Does the agency perform QA activities with internal personnel? If no, skip this table.	X		QA activities are performed by air monitoring personnel. There is no separate QA/QC department.
Does the agency maintain a separate laboratory to support quality assurance activities?		X	Agency contracts with IML for $PM_{2.5}$ lab services
Has the agency documented and implemented specific audit procedures separate from monitoring procedures?	X		Local audit procedures are in the SOPs. The State of Tennessee does independent audits of all monitors every quarter.
Are there two levels of management separation between QA and QC operations? Please explain:		X	The Air Monitoring Manager does the QA/QC Activities. The agency is too small to have a separate department.
Does the agency have separate auditing equipment and standards (specifically intended for sole use) for audits?	X		Has a separate deltaCal for particulate and a separate TECO 49iPS for ozone. Has auditing equipment for PM_{10} if needed. This equipment is not used for any other purpose than audits.

Do you conduct biweekly precision point checks? *Yes*

Are they automated or conducted manually? *Automated*

Select which of the following <u>additional</u> QC you conduct at your gaseous sites				
Precision Checks	Typically Performed?	How?		Frequency
		Manually	Automated	
Precision Point			**X**	
Zero Precision Span	**400**		**X**	**6 days**
Zero Precision	**0, 75**		**X**	**3 days**
Probe Line Integrity Checks	**X**	**X**		
Other: _____				

ii) Audits

Question	Yes	No	Comments
Does the agency have separate facilities to support audits and calibrations?		X	But does have separate equipment
If the agency has in place contracts or agreements with another agency/contractor to perform audits/calibrations, please name the organization and briefly describe the type of agreement.	The State of Tennessee normally performs quarterly audits of all monitors.		
Does the agency maintain independence of audit standards and personnel?	X		State has their own audit equipment that is NIST traceable certified
Do any site operators audit their own sites?		X	Site operators perform monthly flow and leak checks for particulate.
Does the agency have a certified source of zero air for performance audits?		X	Use canisters and a pump –see below
How do you generate your zero air?	Silica gel, pump, drierite, activated carbon:--- Audits: Pump, drierite, activated carbon		
Does the agency have procedures for auditing and/or validation performance of meteorological monitoring?			Not applicable- do not perform meteorological monitoring. Airport is near office
Has the agency established and documented criteria to define agency-acceptable audit results?	X		

Question	Yes	No	Comments
Are your sites regularly reviewed for Appendix E siting criteria?	X		Reviewed in 2015. Will document review yearly going forward.

Do you conduct internal audits of your air monitoring agency?	X		Yes, Ozone only. Because flow and leak checks are done monthly, no internal audits are performed for particulate unless the State fails to do the quarterly audits for some reason. If the State notifies that they will not do their audits, the agency Air Monitoring Manager will do particulate audits.
(1) How frequently?	Quarterly.		
(2) What type of audit is conducted (e.g., performance or systems audit)?	Performance. State does systems audits approximately every 3 years as well.		
(3) Who receives the results of these audits?	All audits performed by the Bureau and the State are loaded into AQS. State sends reports of their audits to the agency Director and EPA SESD.		
(4) Do you report these results to EPA?	X		Local and State audits are loaded into AQS. State audit reports are sent to SESD.

Please provide a list of <u>internal audit standards</u> currently being used (these do not include standards used for calibrations and/or biweekly checks). Add additional lines as necessary.

Name	Model Number	Date of Last Certification	Approximate Age (years)
DeltaCal	**S/N 420, V 3.41**	**7/2/2015**	**15 yrs**
TEI Calibrator	**49iPS**	**1/12/2015**	**9 yrs**
TetraCal	**S/N 586**	**6/25/2015**	**6 yrs**

****Please have certifications of standards available for viewing during the audit**

Question	Yes	No	Comments
Does your agency participate in NPAP, $PM_{2.5}$ PEP, Pb PEP and other performance audits performed by an external party and/or using external standards?	X		
If the agency does not participate, please explain why:			
Are NPAP audits performed by QA staff, site operators, calibration staff, and/or another group?			Performed by EPA staff or EPA contractors
Is your agency audited by the State (if you are a local agency)?	X		
(1) How frequently?	Quarterly		
(2) What type of audit is conducted (e.g., performance or systems audit)?	Performance. Systems audits are performed by State approximately every three years.		
(3) Who receives the results of these audits?	Agency Director and EPA receive quarterly audit report and Systems Audit Reports.		
(4) Do you report these results to EPA?	X		EPA SESD receives a copy of the State Audit Reports. Local and State Audit data loaded into AQS quarterly.

Who is primarily responsible for coordinating participation in:

(1) The National Performance Audit Program (NPAP)? *Kathy Jones*

(2) $PM_{2.5}$ Performance Evaluation Program (PEP)? *Kathy Jones*

(3) Lead Performance Evaluation Program (PEP)? Not Applicable

Please complete the table below:	
Parameter Audited	Date of Last NPAP and/or PEP Audit
CO	
O_3	6/19/2012
SO_2	
NO_2	
$PM_{2.5}$	11/19/2014
Pb	

b) Planning Documents

QMP Questions	Yes	No	Comments
Has the QMP been approved by EPA within the last five years?	X		Date of Original Approval: 12/5/2012 Date of Last Revision: same Date of Last Approval: 12/5/2012
QAPP Questions	**Yes**	**No**	**Comments**
Has the QAPP been reviewed by EPA ?	X		Date of Original Approval: 4/23/2007 Date of Last Revision: same Date of Last Approval: 4/23/2007 Will be resubmitted by date of audit.
Does the State review your QAPP prior to EPA review? (local agencies only)	X		Reviewed by State in 2007 but agency is no longer in the State PQAO. State has a different QAPP. Few operational similarities between the two agencies.
Does your agency have any revisions to your QAPP pending?	X		All SOPs have been submitted, but EPA has only approved one. QAPP will be resubmitted by date of audit
How does the agency verify the QAPP is fully implemented?	Review the QAPP and compare it to normal operational procedures and current SOPs.		
How is the QAPP available to the staff (e.g.., electronically, hard copies at site, etc.)	Hard copies.		
SOP Questions	**Yes**	**No**	**Comments**
How does the agency verify that the SOPs are implemented as provided (e.g., staff are regularly observed for correct implementation of SOPs)?	X		
How are revisions to the SOP distributed?	Employees required to read them and sign a document. Employees assist in writing them.		
How are SOPs available to the staff (e.g.., electronically, hard copies at site, etc.)	Paper copies.		
Are any new monitoring SOPs needed? If yes, please list in comments section.		X	All SOPS are submitted. A revision for the ozone site SOP has been submitted to the State of TN.

List all of the agencies current SOPs:		
Title	Date of Last EPA Approval	Pollutant of Concern (if applicable)
Ozone	2/10/15 and resubmitted	Resubmitted to State 10/2/15. Sent EPA a copy 10/6/15
SRP-10	Submitted: Pending	
Data Handling	Submitted: Pending	
PM10	Submitted: Pending	
PM2.5	Submitted: Pending	

c) General Document Policies

Question	Yes	No	Comments
Does the agency have a documented records management plan?	X		
Does the agency have a list of files considered official records and their media type? (i.e., paper, electronic)	X		Agency compiled a list of electronic records incorporated into Data Handling SOP at SESD request.
Does the agency have a schedule for retention and disposition of records?		X	
Are records maintained for at least three years?	X		Records are normally retained longer than legally required.
Who is responsible for the storage and retrieval of records?	Kathy Jones, Steve Langston, Jim Long.		
What security measures are utilized to protect records?	Electronic records are in individual computers with passwords in a locked laboratory when unoccupied. Recent records in CD back-up are in a locked lab. Historical Records are in locked storage room.		
Where/when does the agency rely on electronic files as primary record?	Continuous monitoring data are stored electronically. EDAS data and AirVision data are stored on two separate computers. The stored data is backed up on CD every two weeks. $PM_{2.5}$ data files are stored electronically. These files are loaded to AQS. All the data are stored electronically.		
What is the system for storage, retrieval and backup of these files?	The data are stored on CDs in a box on the bookshelves in the lab where other records are kept. The City does backups of the server files every two weeks remotely.		

d) Corrective Action(s)

Question	Yes	No	Comments
Does the agency have a comprehensive corrective action program in place?	X		
Have the procedures been documented?	X		
1. As a part of the QA project plan?	X		Data Handling SOP, QAPP, and QMP
2. As a separate standard operating procedure?	X		Data Handling SOP
Does the agency have established and documented corrective action limits for QA and QC activities?	X		
Are procedures implemented for corrective actions based on results of the following which fall outside of established limits:			
1. Performance Evaluations	X		
2. Precision Goals	X		
3. Bias Goals	X		
4. NPAP Audits	X		
5. PEP Audits	X		
6. Validation of one point QC Check Goals	X		
7. Completeness Goals	X		
8. Data Audits	X		
9. Calibrations and Zero Span Checks	X		
10. Technical Systems Audit	X		
Have the procedures been documented?	X		In QMP,QAPP,SOPs

How is responsibility for implementing corrective actions assigned? Briefly discuss
The Air Monitoring Manager is ultimately responsible for making sure corrective actions are implemented.

How does the agency follow up on implemented corrective actions? *Manager discusses corrective action with the technician and follows up to make sure the action is completed.*

Please fill out the table below for precision			
Pollutant	Action Level	Corrective Action (if exceeded)	Redbook Guidance Action Level Reference
O_3	2 ppb off: consider action 3 ppb off take action	Replace all zero air silica gel, drierite, and carbon canisters that are or might be spent. Keep in mind the audit canisters may need changing as well. If that does not fix the problem, recalibrate.	QA Handbook Volume II, Appendix D Revision No. 1 Page 3 of 30
CO	NA	N/A	QA Handbook Volume II, Appendix D Revision No. 1 Page 5 of 30
NO_2	NA	N/A	QA Handbook Volume II, Appendix D Revision No. 1 Page 7 of 30
SO_2	NA	N/A	QA Handbook Volume II, Appendix D Revision No. 1 Page 9 of 30

Please fill out the table below for accuracy			
Pollutant	Action Level	Corrective Action (if exceeded)	Redbook Guidance Action Level
O_3		Replace all zero air silica gel, drierite, and carbon canisters that might be spent. If that does not fix the problem, recalibrate.	QA Handbook Volume II, Appendix D Revision No. 1 Page 3 of 30
CO		N/A	QA Handbook Volume II, Appendix D Revision No. 1 Page 5 of 30
NO_2		N/A	QA Handbook Volume II, Appendix D Revision No. 1 Page 7 of 30
SO_2		N/A	QA Handbook Volume II, Appendix D Revision No. 1 Page 9 of 30

At what point do you invalidate data?

Data is invalidated that that are obviously incorrect. Data that is outside of operational parameters are automatically invalidated (for example: if the operating time is too short). Any data that is considered questionable is reviewed carefully for potential invalidation. AMP 350, 450, 256 (usually others as well) are run every quarter and when validating data for the year. Looking carefully over data that is entered can help to identify data that is not correct. The three 2.5 sites usually have similar data. If data looks odd (unusually low or high), the data from the three FRM $PM_{2.5}$ sites and the Georgia Maple Street site can be graphed together to try to identify outliers. Also regional data can be graphed along with the Bureau sites. Data can be investigated to try to verify the magnitude (for

example- data can be low because it rained at just that site or high because of a fire nearby).

e) Quality Improvement

Question	Yes	No	Comments
Have all deficiencies indicated on the previous TSA been corrected? If not, explain.		X	Have not moved the Eastside Utility site and do not have immediate plans for a move while we address other items in the TSA. May not move it. We are still working on roofing repair and flooring repair of the 4002 shelter that only houses the TEOM. Every other item has been addressed.
What actions were taken to improve the quality system since the last TSA?	New ozone monitors (used ozone season 2015) and one calibrator were purchased. All SOPs were rewritten. New site documents were prepared. PM_{10} monitoring ceased, and the local weigh lab is no longer functioning.		
Since the last TSA, do your control charts indicate that the overall data quality for each pollutant steady or improving?			Main improvement has been studying 1 minute data more. Studying minute data is helpful in diagnosing problems.
For areas where data quality appears to be declining, has a cause been determined?			Data quality is not declining. It is steady or improving.
Are there pending plans for quality improvement such as purchase of new or improved equipment, standards, or instruments?	X		5-Year purchase plan for new equipment. Two new ozone monitors 49i and one new calibrator 49iPS have been purchased in late 2014/early 2015. New monitors were used for 2015 season.

3) NETWORK MANAGEMENT/FIELD OPERATIONS

a) Network Design

Complete the table below for each of the sites in your air monitoring network (active in the last three years) with the number of instruments measuring each pollutant (including NCore low level instruments – e.g. 1 low level CO + 1 regular CO = 2 CO instruments).

AQS ID	Common Site Name	Pb	CO	SO_2	NO_2	O_3	Manual				Collocated		Continuous		Meteorology
							$PM_{2.5}$	PM_{10}	$PM_{2.5}$ speciation	$PM_{2.5}$ Carbon	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	
4002	Siskin Drive/UTC						2						1		
0031	Tombras Ave,/East Ridge						1								
1011	Soddy Daisy High School					1	1								
4003	Eastside Utility					1									

Complete the table below with the number of spare monitor(s) you have on hand for measuring each pollutant (including NCore low level instruments).

Pb	CO	SO_2	NO_2	O_3	Manual				Collocated		Continuous		Meteor-ology
					$PM_{2.5}$	PM_{10}	$PM_{2.5}$ speciation	$PM_{2.5}$ Carbon	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	
				2 monitors 1 calibrator	1	3	1	1			1		

Select which of the following are typically found at your Gaseous and PM sites		
Equipment/ Supplies	Gaseous	PM
Data Logger	X	X- continuous
Calibrator	X	
Gas Blender		
Zero Air System	X	
Perm Tube Oven		
Paper Strip Chart	X	
Permanent Site Computer		
Phone	X	
Modem	X	
DSL Connection		
Cellular Modem Connection		
Meteorological Station		
Interior Temperature Probe	X	Temp logged in logger channel Compared quarterly against NIST traceable thermometer
Interior Min/Max Thermometer		
Air Conditioner / Heater	X	
Uninterrupted Power Supply or Backup Power		
Instrument Manuals	X	
Instrument Logbooks	X	
Site Logbook	Log for each instrument	
SOP's	X	
Other:_____		
Other:_____		

Select which of the following are typical of your Probe System	
Tee'd Probe System	Solenoid switch controlled through data logger determines whether intake is ambient air or whether calibrator ozone is being introduced for audit or precision/span check. All precision checks and audits are through the probe.
Retractable Probe System	
Glass Manifold within Probe System	
Heat Tape for Moisture Control	X

If none of the above is applicable, please describe your probe system.

- *Probe ambient intake and calibrator output enter a solenoid valve that can be toggled on or off manually with the data logger to perform through the probe audits. Toggled automatically using the software for precision or span checks.*

How often do you clean / replace your probe lines?

- *Replaced once a year before March 1.*

What material are your probe lines made of?

- *Teflon.*

What material are your inlet funnels made of (e.g. glass, Teflon, plastic)?

- *Glass.*

How often do you change the particulate filter on the back of the instrument?

- Once a month or more often if required.

How often do you clean your glass manifold (if applicable)? N/A

How do you connect your instrument to your data logger (analog, RS232, or Ethernet)? ***analog***

Question	Yes	No	Comments
What is the date of the most current Monitoring Network Plan?	2015 State of TN Plan submitted to EPA July 1, 2015 Not signed by EPA at this writing- 10/16/15		
Is it available for public inspection?	X		Was put out for public comment for 30 days. Can be provided for public inspection.

Has EPA granted waivers for any of your monitoring sites? *No. No waiver requested.*

Are you aware of any sites that are not currently meeting the requirements of 40 CFR Part 58 Appendix D & E? *No*

Question	Yes	No	Comment
Are hard copy site information files retained by the agency for all air monitoring stations within the network?	X		Updated in 2015
Does each station have the required information including:			
1. AQS Site ID Number?	X		
2. Photographs/slides to the four cardinal compass points?	X		
3. Startup and shutdown dates?	X		
4. Documentation of instrumentation?	X		
Who has custody of the current network documents?	Name: Kathy Jones Title: Air Monitoring Manager/ On bookshelves in Lab		
Does the current level of monitoring effort, station placement, instrumentation, etc., meet requirements imposed by current grant conditions?	X		Exceeds regulatory requirements
How often is the network siting reviewed?	Yearly from 2015 going forward.		
Do any sites vary from the required frequency in 40 CFR 58.12?	X		We operate our collocated $PM_{2.5}$ monitor every three days- more often than required. Purpose is to prevent data loss.
Does the number of collocated monitoring stations meet the requirements of 40 CFR 58 Appendix A?	X		
Is each method for PM monitoring collocated with the same method type? (40 CFR 58 Appendix A Section 3.2.5.2 paragraph (a))	X		

b) Changes to the Network since the Last Audit

Please provide information on any site changes since the last audit:				
Pollutant	Site ID	Site Address	Site Added/Deleted/ Relocated	Reason (Assessment, lost lease, etc.) Provide documentation of reason for each site change
PM_{10}	0006	3300 Broad Street	Deleted	Extremely low data for many years
Speciation- Met One and Carbon	4002	911 Siskin Drive	Deleted	Defunded by EPA

c) Proposed Changes to Network

Please provide information on proposed site changes, including documentation of the need for change and any required approvals:				
Pollutant	Site ID	Site Address	Site to be Added/Deleted/ Relocated	Reason (Assessment, lost lease, etc.) Provide documentation of reason for each site change
$PM_{2.5}$	1011	SDHS Sequoyah Road	Deleted	Low data- monitor not regulatory requirement

d) Field Support

Question	Yes	No	Comments
On average, how often are most of your stations visited by a field operator?	___2___ per _____week__		
Is this visit frequency consistent for all reporting organizations within your agency?			Local agency- no organizations within the agency

i) Instrument Inventory

Please list instruments in your inventory:			
Pollutant	Manufacturer	Models	Reference or Equivalent Method Number
SO_2			
NO_2			
CO			
O_3	Thermo Environmental	2 49i 2 49C 2 49CPS 2 49iPS (one is audit only)	
PM_{10}	Graseby Anderson	3	
$PM_{2.5}$	Thermo/ R & P	4 WINS, 1 VSCC	
Pb			
Multi gas calibrator			
$PM_{2.5}$ speciation	Met One		
$PM_{10\text{-}2.5}$ speciation			
$PM_{10\text{-}2.5}$ FRM mass			
Continuous $PM_{2.5}$ mass	Thermo	2 TEOMS 1400 a	
Trace levels (CO)			
Trace levels (SO_2)			
Trace levels (NO)			
Trace levels (NO_y)			
Surface Meteorology			
Data Logger	ESC loggers/ Some purchased through Agilaire (2- 8832s and rest 8816)	3 in service 1 spare 1 with LCD panel burned out	
Carbon	URG3000	1	

ii) Calibration

Please indicate the frequency of multi point calibrations:		
Pollutant	Frequency	Name of Calibration Method
Ozone	4 times a season and as needed	Using a stationary 49CPS
$PM_{2.5}$ FRM	As needed, verified constantly	Chinook
$PM_{2.5}$ Continuous	As needed, verified constantly	deltaCal or tetraCal

Please list the authoritative standards used for each type of flow measurement, indicate the certification frequency of standards to maintain field material/device credibility:		
Flow Device	Primary Standard	Frequency of Certification
HiVol Orifice	Roots meter at the State of Tennessee	Once per year: No longer keeping it standardized since PM_{10} monitoring is no longer required
Streamline	2 Chinooks- send them to company	Once per year
triCal		
Bios		
deltaCal	BGI/MesaLabs-send it to company	One per year
Gilibrators		
tetraCal	BGI/MesaLabs- send it to company	Once per year

Please list the authoritative standards and frequency of each type of dilution, permeation and ozone calibrator and indicate the certification frequency:		
Calibrator	Primary Standard	Frequency of Certification
Permeation Calibrator Flow Controller		
Permeation Calibrator Temperature		
Dilution Calibrator air and gas Flow Controllers		
Field/Working Standard Photometer	Do not use a bench standard	
Ozone Generator	SESD SRP10-Athens	1 time per year Usually in January or February just before ozone season

Please identify station standards for gaseous pollutants at representative air monitoring stations			
Parameter	Station(s)	Identification of Standard(s)	Recertification Date(s)
CO	N/A		
NO_2	N/A		
SO_2	N/A		
O_3	4003 1011	(2) 49CPS to SRP10/Athens	1/13/2016

If an instrument goes down, at what length of time would you <u>recalibrate</u> the instrument before bringing it back online (24 hours, 48 hours, etc.)? 2 or 3 hours after repairs and after instrument operation seems to be steady.

Question	Yes	No	Comments
Are field calibration procedures included in the document SOPs?	X		Location (site, lab, etc.):
Are calibrations performed in keeping with the guidance in section Vol II of the QA Handbook for Air Pollution Measurements Systems?	X		If no, why not?
Are calibration procedures consistent with the operational requirements of Appendices to 40 CFR 50 or to analyzer operation/instruction manuals?	X		If no, why not?
Have changes been made to calibration methods based on manufacturer's suggestions for a particular instrument?	X		
Do standard materials used for calibrations meet the requirements of appendices to 40 CFR 50 (EPA reference methods) and Appendix A to 40 CFR 58 (traceability of materials to NIST-SRMs or CRMs)?	X		
Where do field operations personnel obtain gaseous standards?	No gas standards used. N/A		

Are those standards certified by: 1. The agency laboratory?			N/A
2. EPA/NERL standards laboratory?			
3. A lab separate from this agency's but part of the same reporting organization?			
4. The vendor?			
5. Other (describe)			
How are the gas standards verified after receipt?			
Are you involved in the EPA protocol gas certification program?			
What equipment is used to perform calibrations (e.g., dilution devices) and how is the performance of this equipment verified?			
Does the documentation include expiration date of certification?			
1. Reference to primary standard used?			
2. What traceability is used?			
Is calibration equipment maintained at each station?			
How is functional integrity of this equipment documented?			
Who has responsibility for maintaining field calibration standards?			

iii) Repair

a) Who is responsible for performing preventative maintenance? *Two technicians*

b) Is special training provided to them for performing preventative maintenance? Briefly comment on background or courses. ***They received training at the beginning of the $PM_{2.5}$ program. Some training was done at Region 4 Workshop. They were also sent to ESC in Knoxville for training on the data loggers about 10 years ago.***

c) Is this training routinely reinforced? If no, why not? No, training is based on necessity (for example: if we receive new equipment) and funds available. Technicians are sent to any EPA required training such as the recently provided QA/QC training.

d) **What is your preventative maintenance schedule for each type of field instrumentation?** *Clean WINS monthly, VSCCs quarterly, downtubes and rain hats yearly. Valves and pumps are changed at least once a year. Ozone instruments are completely reworked before the start of each year's season. New lines are installed and the technician goes through the instruments carefully and orders any replacement parts needed. Since the monitors were new in the 2015 ozone season, not much will have to be replaced for a few years.*

e) **If preventative maintenance is <u>MINOR</u>, it is performed at (check one or more):**
_X__ Field Station
___ Headquarters Facilities
___ Equipment is sent to Manufacturer

f) **If preventative maintenance is <u>MAJOR</u>, it is performed at (check one or more):**
___ Field Station
__X_ Headquarters Facilities <u>or</u>
__X_ Equipment is sent to Manufacturer

g) **Does the agency have service contracts or agreements in place with instrument manufacturers? Indicate below which instrumentation is covered.** *No. We do, however, have all Thermo Environmental Instruments except for the PM_{10} Hi Vol.*

h) **Comment briefly on the adequacy of availability of the supply of spare parts, tools and manuals available to the field operator to perform any necessary maintenance activities. Do you feel that this is adequate to prevent any significant data loss?** *Yes*

i) **Is the agency currently experiencing any recurring problem with equipment or manufacturer(s)? If so, please identify the equipment manufacturer, and comment on steps taken to remedy the problem.** ***No, vendors are very responsive.***

j) **Have you ever lost any data due to repairs in the last 2 years?**
More than 24 hours?
More than 48 hours?
More than a week? *Lost TEOM data --only for AQI. Instrument is very old and slated for replacement. It is not FEM.*

k) **Explain any situations where instrument down time was due to lack of preventative maintenance or unavailability of parts.** ***TEOM downtime was due to not wanting to spend significant money on a very old monitor and not having money available to purchase a new one. Borrowed another old TEOM from the State of Tennessee.***

iv) Logbooks and Records

Question	Yes	No	Comments
What type of station logbooks are maintained at each monitoring station? (Maintenance logs, calibration logs, personal logs, etc.)	Bound Logbooks and Messages to Central in Logger. State auditor leaves site Operator messages.		
What information is included in the station logbooks?	Everything: audits, maintenance, instrument readings. Everything in the bound logbooks is supposed to be entered into the Messages of the logger.		
Who reviews and verifies the logbooks for adequacy of station performance?	Air Monitoring Manager: quarterly for ozone logbooks during quarterly audits.		
How often are logbooks reviewed?	Once a quarter by Air Monitoring Manager. Look over Messages to Central and Messages to Operator about once a quarter to make sure they are being entered.		
How is control of logbook maintained?	Sites at 4002 and 0031 have a locked gate. Site at 0031 has a locked gate. Site 4003 is in high security area- no need for fence. Copies are run quarterly of the logbooks and Messages to Central in the logger are downloaded with each data download.		
Where is the completed logbook archived?	Banker boxes in locked storage, on bookcase in Air Monitoring Manager's office		
What other records are retained?			
1. Zero span record?	X		Printed report put in notebook.
2. Gas usage log?			N/A
3. Maintenance log?	X		In bound log book for each monitor
4. Log of precision checks?	X		Printed report put in notebook.
5. Control charts	X		Strip charts are annotated and stored.
6. A record of audits?	X		Audits are recorded on paper strip charts. Minute graphs of the audit can be printed from AirVision. Minute averages of the audit can be printed on the daily parameter report. Audit data are loaded into AQS. AQS text files are retained, can run AMP reports from AQS to show audits.
Please describe the use and storage of these documents.	Strip Charts are a stored back-up. Minute graphs can be run but must be run before data is overwritten.		

Are calibration records, or at least calibration constants, available to field operators?	X		Yes.
Are logbooks backed up regularly to ensure against theft/vandalism?	X		Quarterly

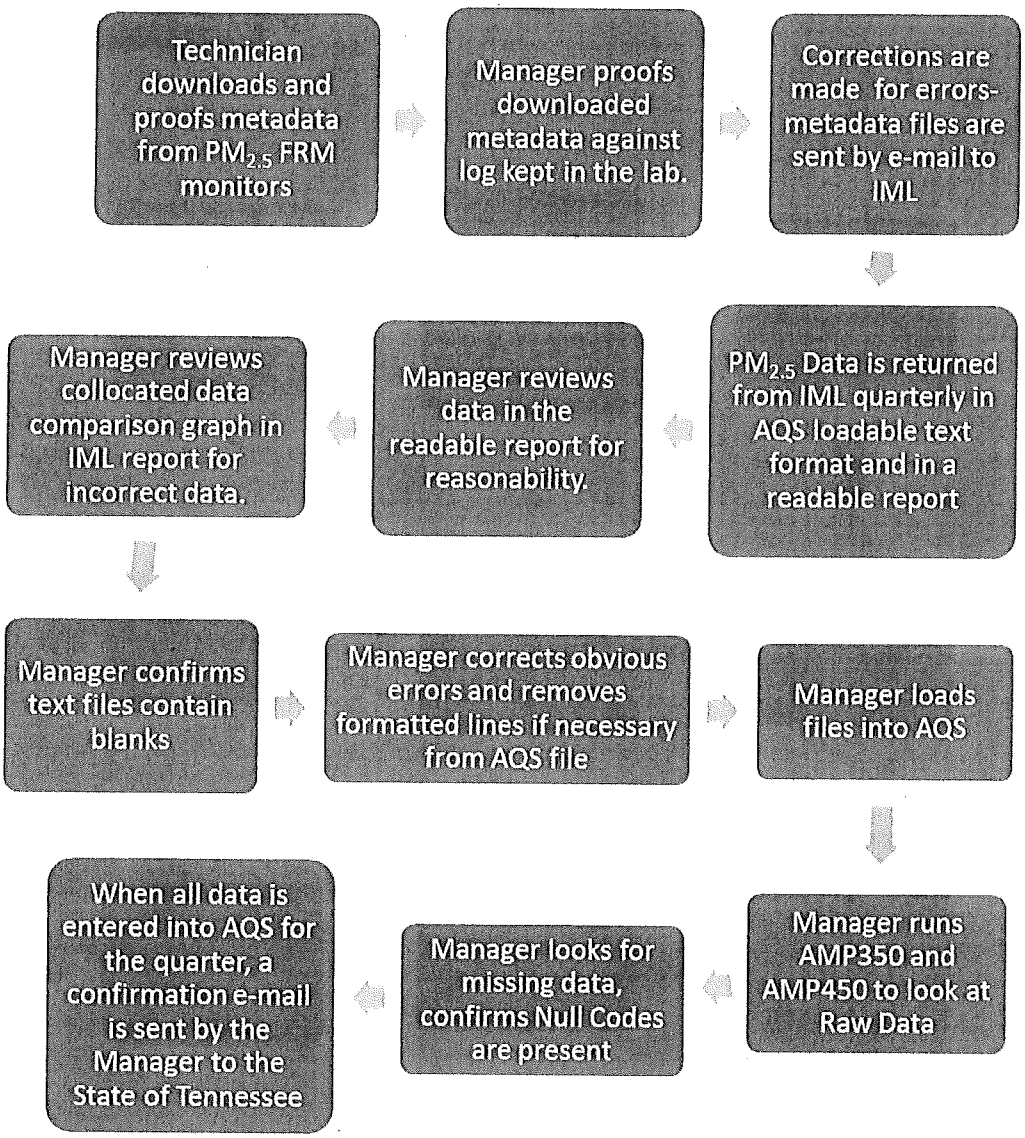
3) DATA MANAGEMENT

a) Data Handling

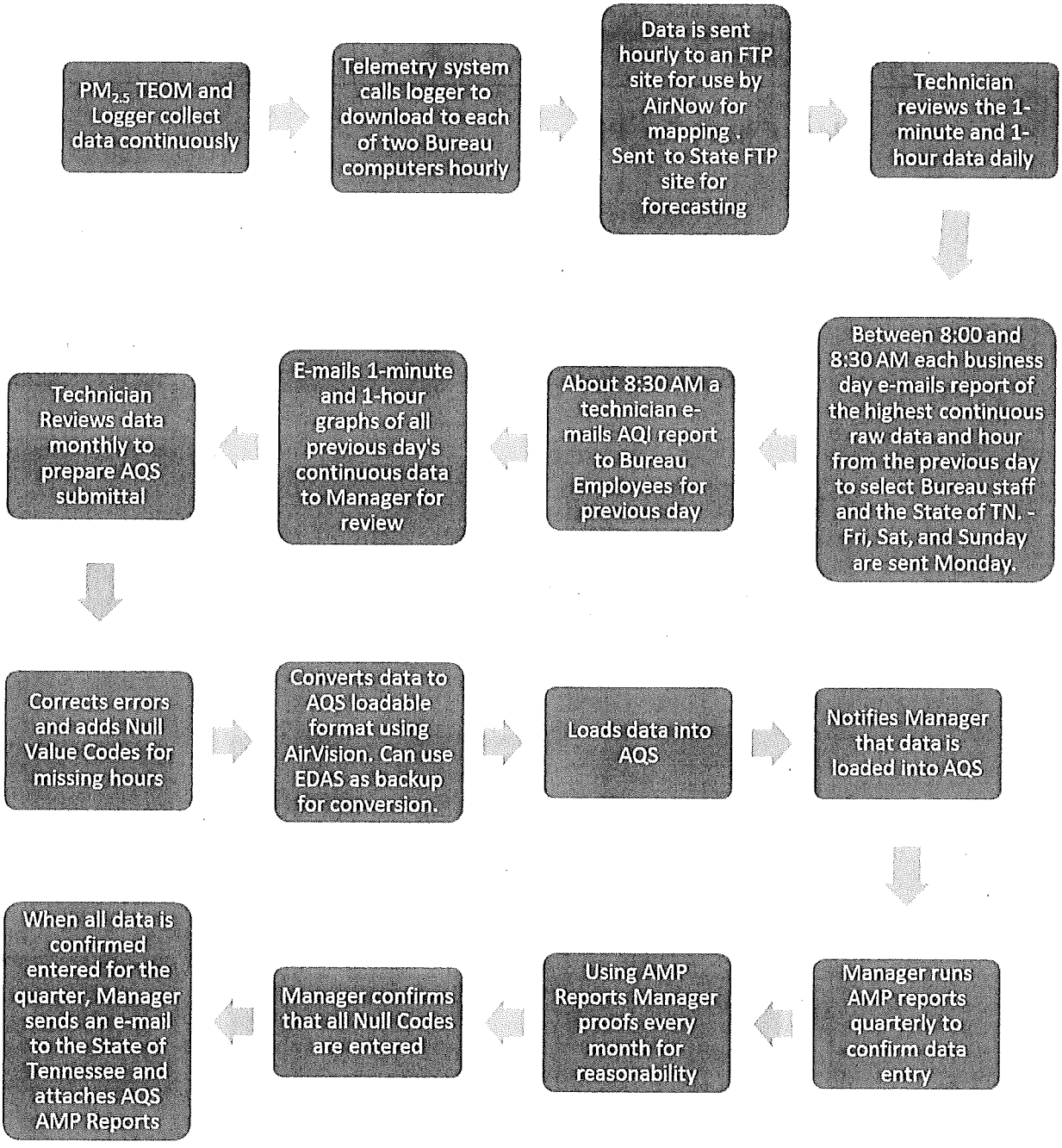
Question	Yes	No	Comments
Is there a procedure, description, or a chart which shows a complete data sequence from point of acquisition to point of submission of data to EPA?	X		Data Handling SOP pending at EPA SESD
Please describe or provide a data flow diagram from collection to submittal of data. Please include detail regarding data review and validation.	See flow charts below this table		
Are procedures for data handling (e.g. data reduction, review, etc.) documented?	X		Data Handling SOP
In what media (e.g., diskette, data cartridge, or telemetry) and formats do data arrive at the data processing location? Please list below:			
Category of Data (by Pollutant)	Data Media and Formats		
$PM_{2.5}$	Electronic		
$PM_{2.5}$ Continuous	Electronic		
Ozone	Electronic		
How often are data received at the processing location from the field sites and laboratory?	Quarterly or Monthly. Continuous data is usually loaded into AQS monthly unless a technician has been out of the office.		
Is there documentation accompanying the data regarding any media changes, transcription, or flags which have been placed into the data before data are released to agency internal data processing?	X		Notes are sent to IML if needed. IML sends e-mails. Stay in close communication.
- Describe the type of documentation	A document is prepared for IML in the shipment that lists 2.5 filters that are voided and any notes for IML. The field data sheet has a note as to why there is a void and also there is a log book in the lab with notes. The log book is intended to be a "go to" document that tells specifically when each filter ran through the monitor --with notes if it did not run and why. There is also a chain of custody form and small data labels are attached to the petri dishes. The data labels are cut from a copy of the field data sheet.		

How is data actually entered into the computer system (e.g. computerized transcription ,copy from disk or data transfer device), manual entry, digitization of strip charts, or other)?	Computerized transcription to AQS format using AirVision or EDAS for continuous monitors, $PM_{2.5}$ data sent to Bureau in AQS format from IML.		
For manual data, is a double-key entry system used (e.g., a second pair of eyes double checking for transcription errors)?			No more manual entry into a database since PM_{10} shut down. Do manually make some P & A files.

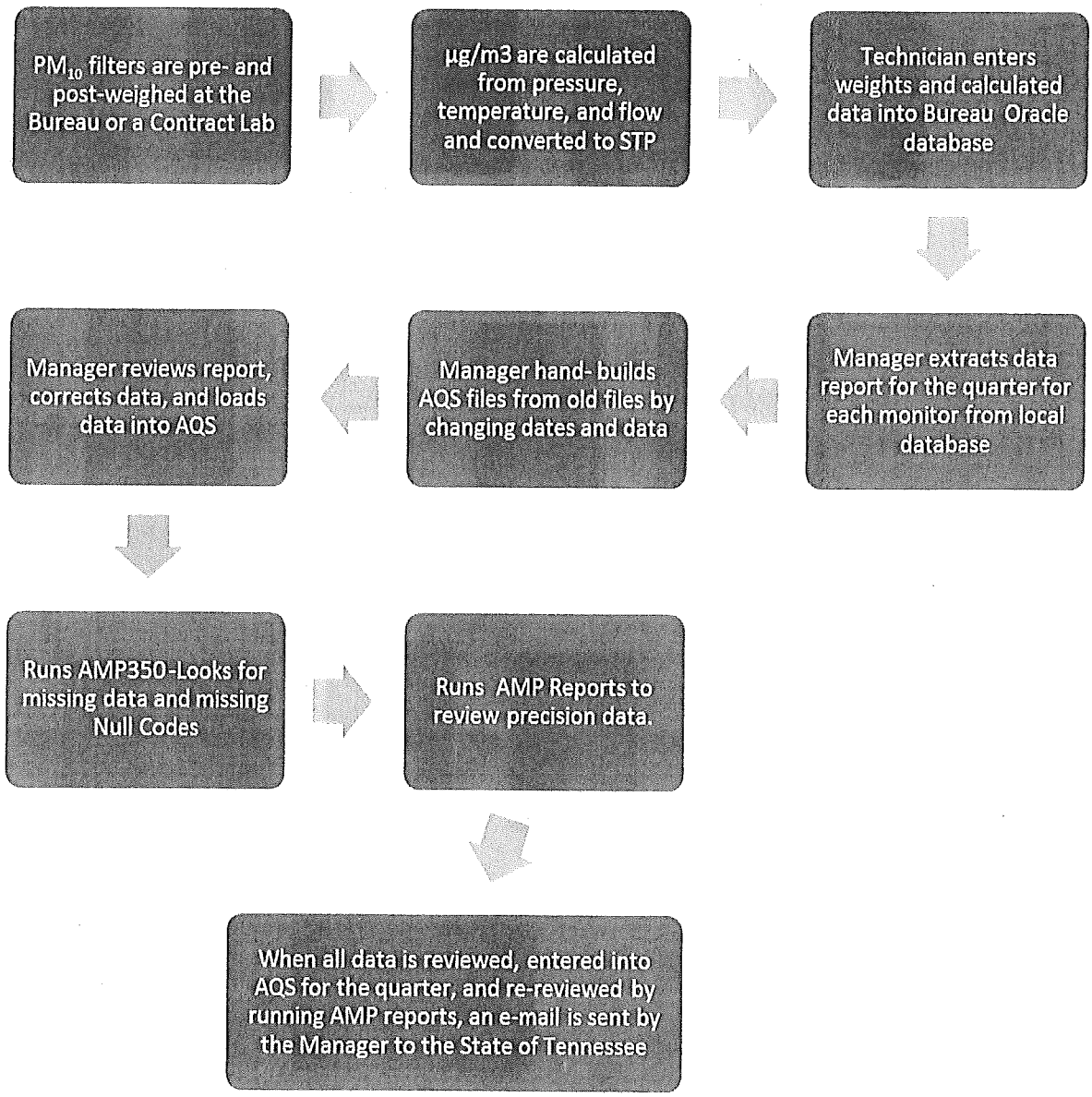
Flow Chart for $PM_{2.5}$



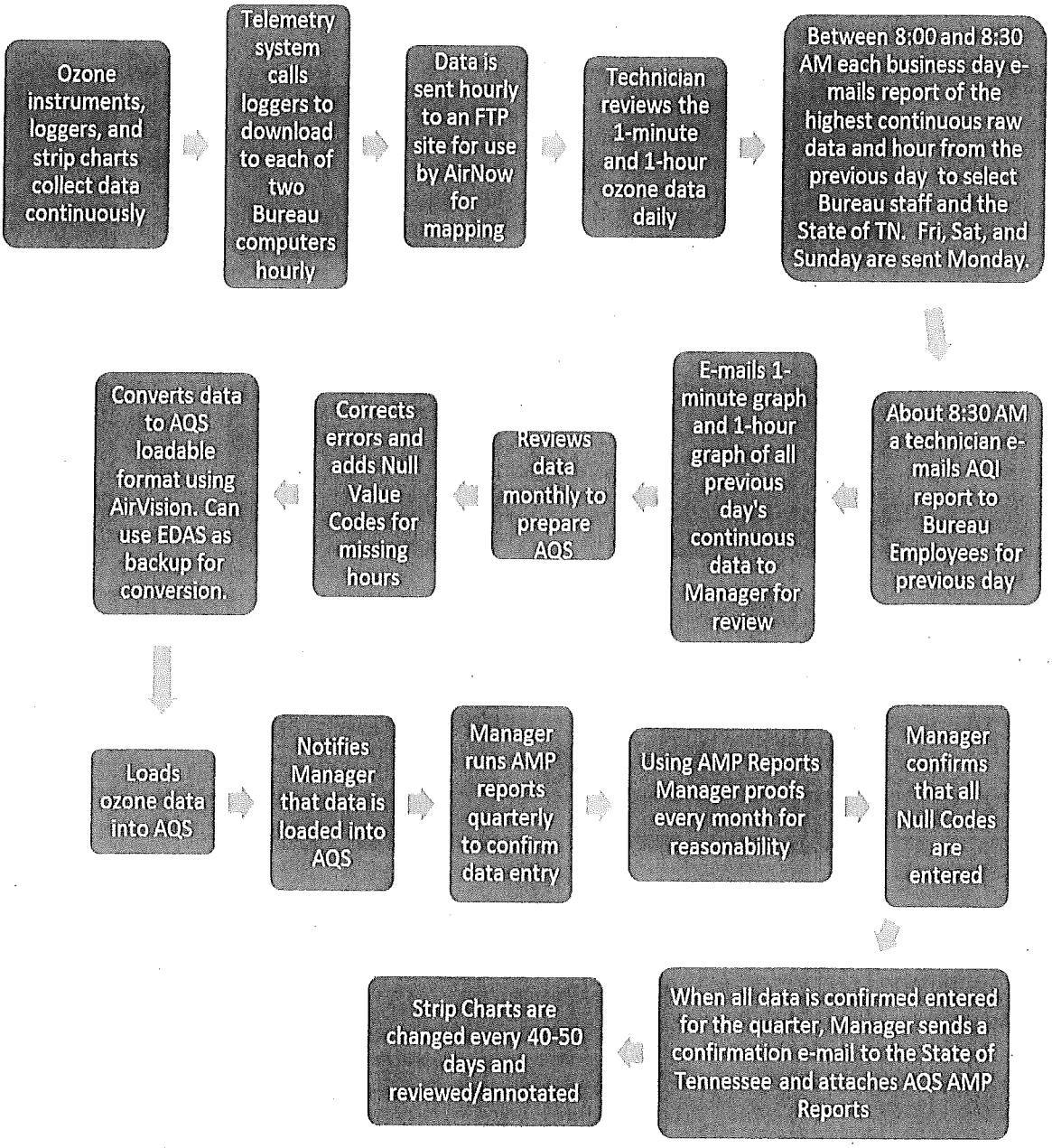
Flow Chart for Continuous $PM_{2.5}$



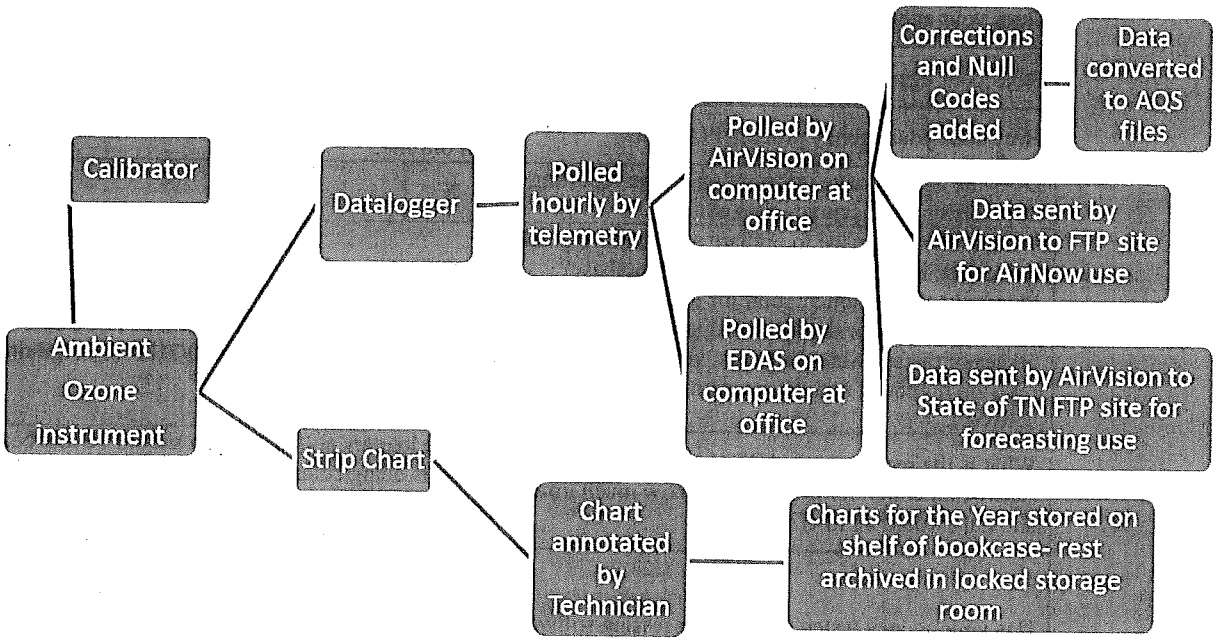
Flow Chart for PM_{10} (Not currently being monitored)



Flow Chart for Ozone



Ozone Site Configuration



b) Software Documentation

Question	Yes	No	Comments
Does your agency submit data directly to AQS?	X		
Does your agency participate in AirNow?	X		
How does your agency process P/A data?	Manually by using the P & A generator or altering an old file.		
Does the agency have information on the reporting of precision and accuracy data available?	X		
What software is used to prepare air monitoring data for release into the AQS and AirNow database? Please list the documentation for the software currently in use for data processing, including the names of the software packages, vendor or author, revision numbers, and the revision dates of the software.	EDAS V 5.52 (Agilaire) and AirVision V.2.13.270 build 2015.06.25.3 most current version as of 10/7/15 (by Agilaire)		
What is the recovery capability in the event of a significant computer problem (i.e. how much time and data would be lost)?	If the loggers polled, no data should be lost because data is being collected by two different CPUs. Each is a backup for the other. It is not likely that both computers will go down at the same time.		
Has your agency tested the data processing software to ensure its performance of the intended function is consistent with the QA Handbook, Volume II, and Section 14.0?		X	This question is assumed to refer to laboratory data processing software or hand entered data in spreadsheets that do calculations. IML supplies $PM_{2.5}$ data in final format, and PM_{10} is no longer handled. Ozone and $PM_{2.5}$ continuous data are all electronic.
Does your agency document software tests?		X	Do not need to perform software tests. If yes, provide the documentation

c) Data Validation and Correction

Question	Yes	No	Comments
Has your agency established and documented the validation criteria?	X		Data Handling SOP
Does documentation exist on the identification and applicability of flags (i.e., identification of suspect values) within the data as recorded with the data in the computer files?	X		Data Handling SOP
Does your agency document the data validation criteria including limits for values such as flow rates, calibration results, or range tests for ambient measurements?	X		Data Handling SOP
1. If yes, please describe what action the data validator will take if he/she find data with limits exceeded (e.g., flags, modifies, deletes, etc.)	If flow or leak check is exceeded, data is voided. If time range is exceeded (normally by seconds), data is not voided.		
2. If yes, give examples to illustrate actions taken when limits are exceeded.	About 2003 one 2.5 FRM monitoring site failed a flow audit. A review of the flow data indicated that the flow had been drifting. The data was voided for a couple of weeks back to a passing flow check.		
How does the agency track missing data?	Missing data is obvious on AMP reports. For ozone, missing data can be compared to the site log. For $PM_{2.5}$ missing data can be compared to the log kept in the lab where filters are noted and reasons for voids.		
Please describe how changes made to data that were submitted to AQS and AirNow are documented.	Changes are normally made at certification time and the changes specified in the certification letter. If changes to certified data are made outside of that time frame, a letter detailing the changes would be sent to EPA along with a request for recertification.		
Who has signature authority for approving corrections?	Name: Kathy Jones or Robert Colby, Director Program Function: Air Monitoring Manager		
What criteria are used to determine a data point should be deleted? Discuss briefly	Out of specs, illogical, not similar in data to nearby sites (with no explanation- like rain), tech self - reports a problem (not sure monitor functioned correctly for specific run),		
What criteria are used to determine if data need to be reprocessed? Discuss briefly	AMP reports are run at the end of each quarter to demonstrate that data for the previous quarter has been entered. Data is carefully reviewed and investigated if it is not reasonable.		
Are corrected data resubmitted to the issuing group for cross-checking prior to release?			N/A – no separate issuing group. AMP reports reviewed quarterly and yearly. Strange data in AQS is removed and replaced with Void lines.

d) Data Processing

Question	Yes	No	Comments
Does the agency generate data summary reports?	X		AMP Reports
Please list at least three reports routinely generated, including the information requested below.			
Report Title	Distribution		Period Covered
AMP 350, 450, 256 (sometimes 251)	Sent to State		Quarterly
AMP 256 and 450NC (normally others as well)	Sent to State and EPA		Yearly

Question	Yes	No	Comment
How often are data submitted to AQS and AirNow?	Daily to AirNow. Ozone and continuous $PM_{2.5}$ are submitted monthly and FRM particulate and P & A are submitted Quarterly to AQS		
Briefly comment on difficulties the agency may have encountered in coding and submitting data following the guidance of AQS guidelines	No real problems. Two of the three submitters have many years' experience.		
Does the agency routinely request a hard copy printout on submitted data from AQS?	X		N/A- Agencies have direct access to reports
Are records kept for at least 3 years by the agency in an orderly, accessible form?	X		Yes. Some reports are now in electronic form.
If yes, does this include: 1. Raw Data?			Electronically
2. Calculation?			N/A- No longer do PM_{10}. $PM_{2.5}$ mass calculations performed at IML.
3. QC Data?	X		Paper form for ozone
4. Reports?	X		Electronic report from IML and electronic AQS files
If no, please comment			
Are PM_{10} concentrations corrected to EPA standard temperature and pressure conditions (i.e. 298°K, 760 mm Hg) before input to AQS?			No PM10 Monitoring. $PM_{2.5}$ is at local conditions.
Are $PM_{2.5}$ and Lead concentrations reported to AQS under actual (volumetric) conditions?			Yes for 2.5. No lead monitoring.
Are audits on data reduction procedure performed on a routine basis?			No real data reduction. IML provides 2.5 data. Ozone data is provided by instrument. Continuous 2.5 is calculated in the instrument.
Are data precision and accuracy checked each time they are calculated, recorded, or transcribed to ensure incorrect values are not submitted to EPA?	X		Checked and doublechecked.

e) Internal Reporting

What internal reports are prepared and submitted as a result of the audits required under 40 CFR 58, Appendix A?	
Report Title	Frequency
Audit letter and report to Agency Director from State of Tennessee Auditor	Quarterly
AMP P & A reports for the year are submitted to the Director	Yearly at Certification time

What internal reports are prepared and submitted as a result of precision checks also required under 40 CFR 58, Appendix A?	
Report Title	Frequency
Precision check reports for ozone are printed from the software and put in a book. Copies are sent electronically to the Air Monitoring Manager	Every 3rd day

Question	Yes	No	Comments
Do either the audit or precision check reports indicated include a discussion of corrective actions initiated based on audit or precision check results?		X	No because the reports are printed from the data software

Who has the responsibility for the calculation and preparation of data summaries? To whom are such summaries delivered? *Normally run AMP reports quarterly for data summaries . AMP reports are sent quarterly to the State to prove data is entered. Yearly AMP reports submitted to Mr. Colby.*

Name	Title	Type of Report	Recipient
Kathy Jones	Air Monitoring Manager	AMP 256, 450NC	Robert Colby (yearly)
Kathy Jones	Air Monitoring Manager`	AMP 256, 350, 450	State of Tennessee (quarterly)

f) External Reporting

For the past 3 calendar years, please list all quarters that data were submitted beyond the 90 day requirement: *Never late.*

Identify the individual within the agency with the responsibility for reviewing and submitting the data to AQS. *Kathy Jones, Jim Long, Steve Langston -- Kathy Jones has been responsible for 2.5, 10, audits, flow audits, and reviewing AMP reports and Jim Long has been responsible for converting continuous ozone and particulate data to AQS format, proofing, and loading continuous data. Steve Langston is in training.*

Question	Yes	No	Comments
Does your agency report the Air Quality Index?	X		
Has your agency submitted its annual data summary report (as required in 40 CFR 58.15)?	X		Yes, Required AMP reports are submitted with the Certification Letter
If yes, did your agency's annual report include the following:			
1. Annual precision and accuracy information described in Section 4 of Appendix A?	X		
2. Location, date, pollution source and duration of all episodes reaching the significant harm levels?	X		
Is Data Certification signed by a senior officer of your agency?	X		Signed by the Director

4) LABORATORY OPERATIONS

a) Routine Operations

What analytical methods are employed in support of your air monitoring network? Add other pollutants not listed to the table.		
Pollutant	Analysis	Name or Description of Method
PM_{10}	Not currently being monitored	
$PM_{2.5}$	Performed by IML	Gravimetric weighing
Pb		
$PM_{10-2.5}$		

Please describe areas where there have been difficulties meeting the regulatory requirements for any of the above analytical methods. *We were unable to meet temperature and humidity controls with our PM_{10} weigh area without spending a lot of money. Deleting the PM_{10} part of our program resolved that issue.*

Please identify the current versions of written methods, supplements, and guidelines that are used in your agency. Add other pollutants not listed to the table.	
Analysis	Documentation of Method
PM_{10}	Draft SOP
$PM_{2.5}$	Draft SOP
Pb	
$PM_{10-2.5}$	

Question	Yes	No	Comments
Were procedures for the methods listed above included in the agency's QA Project Plan or SOPs and reviewed by EPA?	X		Number of SOPs still pending at SESD.
Are the SOPs easily/readily accessible for use and reference?	X		
Does your lab have sufficient instrumentation to conduct analyses?	X		Analyses are contracted to IML

Please describe needs for laboratory instrumentation. ***No needs.***

b) Laboratory Quality Control *Not applicable to CHCAPCB*

Please identify laboratory standards used in support of the air monitoring program, including standards which may be kept in an analytical laboratory and standards which may be kept in a field support area or quality assurance laboratory that is dedicated to the air monitoring program (attach additional sheets if appropriate):

Parameter	Type	ID / Serial Number	Last Recertification Date
Weights			
Temperature			
Relative Humidity			
Barometric Pressure			
Balance			
Other			

****Please have certifications of standards available for viewing during the audit**

Question	Yes	No	Comments
Are all chemicals and solutions clearly marked with an indication of shelf life?			
Are chemicals removed and properly disposed of when shelf life expires?			
Are only ACS grade chemicals used by the laboratory?			

Comment on the traceability of chemicals used in the preparation of calibration standards.

Question	Yes	No	Comment
Does the laboratory purchase standard solutions such as those for use with lead or other metals analysis?		X	Not Applicable
Are all calibration procedures documented?			Title: Revision Number: Document Location:
Are at least one duplicate, on blank, and one standard or spike included with a given analytical batch?			
Briefly describe the laboratory's use of data derived from blank analyses:			
Are criteria established to determine whether blank data is acceptable?			

How frequently and at what concentration ranges does the lab perform duplicate analysis? What constitutes an acceptable agreement?

Please describe how the lab uses data obtained from spiked samples, including the acceptance criteria (e.g., acceptable percent recovery).

Question	Yes	No	Comments
Does the laboratory routinely include samples of reference material within an analytical batch?			Not Applicable
If yes, indicate frequency, level, & material Used			
Are mid-range standards included in analytical batches?			
Please describe the frequency, level, and compound used in the comments section.			
Are criteria for real time quality control established that are based on results obtained for the mid-range standards discussed above?			
If yes, briefly discuss them in the comments section or indicate the documentation in which they can be found:			
Are appropriate acceptance criteria for each type of analysis documented?			

c) Laboratory Preventative Maintenance

Question	Yes	No	Comments
For laboratory equipment, who has the responsibility for performing preventative maintenance?			
Is most maintenance performed in the lab?			
Is a maintenance log maintained for each major laboratory instrument?			
Are service contracts in place for major analytical instruments?			

d) Laboratory Record Keeping

Question	Yes	No	Comments
Are all samples that are received by the laboratory logged in?			
If appropriate, is sample shipping temperature recorded upon arrival?			
Discuss sample routing and special needs for analysis (or attach a copy of the latest SOP which covers this). Attach a flow chart if possible.			
Are log books kept for all analytical laboratory instruments?			
Are there log books or other records that indicate the checks made on materials and instruments such as weights, humidity indicators, balances, and thermometers?			
Are log books maintained to track the preparation of filters for the field?			
1. Are they current?			
2. Do they indicate proper use of conditioning?			
3. Weighings?			
4. Stamping and numbering?			
Are log books kept which track filters returning from the field for analysis?			
How are date records from the laboratory archived?			
1. Where?			
2. Who has the responsibility? Title?			
3. How long are records kept?			
Does a chain-of-custody procedure exist for laboratory samples?			Title & Date: Revision Number: Location:

e) Laboratory Data Acquisition and Handling

Question	Yes	No	Comments
Identify those laboratory instruments which make use of computer interfaces directly to record data. Which ones use strip charts? Integrators?			
Are QC data readily available to the analyst during a given analytical run?			
What is the laboratory's capability with regard to data recovery? In case of problems, can they recapture data or are they dependent on computer operations? Discuss briefly.			
Has a user's manual been prepared for the automated data acquisition instrumentation?			

Please provide below a data flow diagram which establishes, by a short summary flow chart: transcriptions, validations, and reporting format changes the data goes through before being released by the laboratory.

f) Specific Pollutants: Particulate Matter

High Vol PM_{10}			
Question	**Yes**	**No**	**Comments**
Does the agency use filters supplied by EPA?			N/A No PM_{10} Monitoring
Do filters meet the specifications in 40 CFR 50?			
Are filters visually inspected for defects before exposure?			
Where does the laboratory keep records of the serial numbers of filters?			
Are the temperature and humidity monitors calibrated?			
Are balances checked with Class S or Class M weights each day when they are used?			
To what sensitivity are filter weights recorded?			
What method of documentation is used to record filter weighing sessions? (e.g., logbook, computer software, etc.)			
During conditioning, are the following true:			
(1) Filters equilibrate for a minimum of 24 hours			
(2) The temperature range is from 15°C-30°C			
(3) Temperature control is ±3°C SD over 24 hrs			
(4) Humidity range is 20% - 45% RH			
(5) Humidity control is ± 5% SD over 24 hrs			
(6) Pre/post sampling RH difference in 24-hr means is ≤± 5% RH			
(7) Balance is located in the conditioning environment			
Are filters packaged for protection while transporting to and from the monitoring stations?			
Are filters shipped at ambient temperature to the monitoring stations?			
Are filters shipped at ambient temperature from the field to the laboratory?			
Are exposed filters reconditioned for at least 24 hrs in the same conditioning environment as for unexposed filters?			
Briefly describe how exposed filters are prepared for conditioning			
Briefly describe how exposed filters are stored after being weighed			
Are blank filters reweighed?			
Are chemical analyses performed on filters?			
If yes, what analysis is performed?			
$PM_{10-2.5}$ / Low Vol PM_{10} / $PM_{2.5}$			

Question	Yes	No	Comments
Does the agency use filters supplied by EPA?			
Do filters meet the specifications in 40 CFR 50?			
Are filters visually inspected via strong light from a view box for defects before exposure?			
Where does the laboratory keep records of the serial numbers of filters?			
Are temperature and humidity monitors calibrated?			
Are balances checked with Class 1 weights each day when they are used?			
To what sensitivity are filter weights recorded?			
What method of documentation is used to record filter weighing sessions? (e.g., logbook, computer software, etc.)			
During conditioning, are the following true:			
(1) Filters equilibrate for a minimum of 24 hours			
(2) The temperature range is 20°C-23°C for the 24-hr mean			
(3) Temperature control is ±2°C SD over 24 hrs			
(4) Humidity range is 30%-40% RH for 24-hr mean OR ≤5% sampling RH but >20% RH			
(5) Humidity control is ± 5% SD over 24 hrs			
(6) Pre/post sampling RH difference in 24-hr means is ≤± 5% RH			
(7) Balance is located in the conditioning environment			
Are filters packaged for protection while transporting to and from the monitoring stations?			
Are filters shipped at ambient temperature to the monitoring stations?			
Are filters shipped at ≤ 4°C from the field to the laboratory?			
Are filters post-weighed in ≤30 days?			
Are filters post-weighed in ≤10 days if they arrive >4°C?			
Are exposed filters reconditioned for at least 24 hrs in the same conditioning environment as for unexposed filters?			
Briefly describe how exposed filters are prepared for conditioning			
Briefly describe how exposed filters are stored after being weighed			
Are blank filters reweighed?			
Are chemical analyses performed on filters?			
If yes, what analysis is performed?			

Lead			
Question	**Yes**	**No**	**Comments**
Does the agency use filters supplied by EPA?			Not Monitoring for Lead
Is analysis for lead being conducted using atomic absorption spectrometry with air acetylene flame?			
If not, has the agency received an equivalency designation for their procedure?			
Is either the hot acid or ultrasonic extraction procedure being followed precisely?			Which?
Is Class A borosilicate glassware used throughout the analysis?			
Is all glassware cleaned with detergent, soaked and rinsed three times with distilled or deionized water?			
If extracted samples are stored, are linear polyethylene bottles used?			
Are all batches of glass fiber filters tested for background lead content?			
At a rate of 20 to 30 random filters per batch of 500 or greater?			Indicate Rate -
Are ACS reagent grand HNO_3 and HCl used in the analysis?			
Is a calibration curve available having concentrations that cover the linear absorption range of the atomic absorption instrumentation?			
Is the stability of the calibration curve checked by alternately re-measuring every 10^{th} sample a concentration # 1Φg Pb/ml; # 10 Φg Pb/ml?			

END OF REPORT

EMISSIONS INVENTORY
QUALITY ASSURANCE PROJECT PLAN

Chattanooga-Hamilton County
Air Pollution Control Bureau

August 10, 2017
(Replaces Previous Version Dated September 13, 2010)

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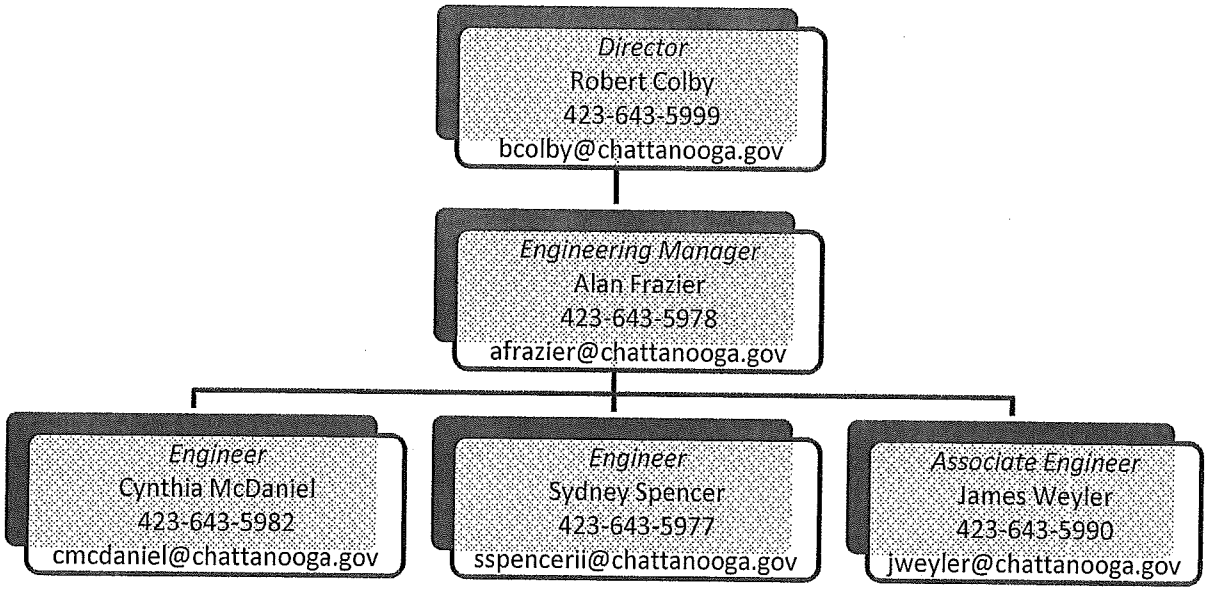
1.0 PROJECT ORGANIZATION

The Chattanooga-Hamilton County Air Pollution Control Bureau (the Bureau) is a local air agency that is responsible for regulating air pollution within Hamilton County, Tennessee, including the City of Chattanooga and the nine other municipalities in the county. The Bureau operates under a Certificate of Exemption from the State of Tennessee. The Engineering Department of the Bureau is responsible for maintaining an air pollutant emissions inventory for Hamilton County in the form of an electronic database. The Engineering Department periodically submits pertinent data from this inventory to the Emissions Inventory System (EIS). Data from the EIS is then used by the U.S. Environmental Production Agency (EPA) to create a National Emissions Inventory (NEI) for the reporting year.

All departments of the Bureau are supervised by the *Director*, Robert Colby. The Engineering Department is overseen by the *Engineering Manager*, Alan Frazier. Other personnel of the Engineering Department are two *Engineers*, Cynthia McDaniel and Sydney Spencer; and an *Associate Engineer*, James Weyler.

The Engineering Manager, Engineers, and Associate Engineer are each responsible for air pollution permitting of specific facilities within Hamilton County. They each input and update information, as it becomes available, into the Bureau Emissions Inventory for the facilities for which they are responsible. The Engineering Manager and Engineers also review data that is to be provided to the various components of the EIS and assemble this data into the required electronic submittal format. The Engineering Manager is authorized to directly submit data to the EIS. In addition, the Engineering Manager is responsible for maintaining the Emissions Inventory Quality Assurance Project Plan.

Organization Chart



2.0 PROBLEM DEFINITION AND BACKGROUND

The Bureau was formed in 1969. At that time, Chattanooga had been recognized by the National Air Pollution Control Administration of the U.S. Department of Health, Education, and Welfare as the most polluted city in the nation due to its heavy industrial base with unregulated air pollutant emissions and a topography that hindered those emissions from dispersing. The Chattanooga Air Pollution Control Ordinance (the Ordinance) was adopted by local government, and every major air pollution source in Hamilton County had achieved compliance with the provisions of the Ordinance by October 1972 at a cost, for that time, of over $40 million.

The Bureau Emissions Inventory serves as an indispensable depository of data regarding all facilities that are permitted by the Bureau. This data includes contact information, geographic coordinates, compliance dates, and applicable North American Industry Classification System (NAICS) codes at the "company" level; hourly and annual air pollutant emission rates and permit or certificate fee information at the "certificates" level; and release point parameters, operating hours, and appropriate Source Classification Codes (SCC) at the "process components" level.

The Air Emissions Reporting Requirements (AERR) rule (Title 40 *Code of Federal Regulations* Part 51, Subpart A) specifies the requirements for air agencies to report air pollutant emissions data to the EIS. This rule was originally promulgated on December 17, 2008, and it was revised on February 19, 2015.

All information pertaining to permitted facilities that must be provided to the EIS is maintained in the Bureau Emissions Inventory. Facility and release point information for the EIS is entered and updated electronically by way of the EIS Gateway website, and air pollutant emissions data is submitted to the EIS electronically through the Central Data Exchange (CDX).

3.0 PROJECT DESCRIPTION

Actual annual emissions of the following criteria air pollutants (CAPs) and CAP precursors are required to be submitted by air agencies to the EIS:

- Primary total particulate matter (filterable and condensable) ≤ 2.5 µm ($PM_{2.5}$)
- Primary total particulate matter (filterable and condensable) ≤ 10 µm (PM_{10})
- Nitrogen oxides (NO_X)
- Sulfur dioxide (SO_2)
- Carbon monoxide (CO)
- Volatile organic compounds (VOCs)
- Ammonia (NH_3)
- Lead and lead compounds

The Bureau will also continue to voluntarily submit to the EIS actual annual emissions of any of the 187 hazardous air pollutants (HAPs) from permitted facilities that are included in the Bureau Emissions Inventory. Furthermore, the Bureau will begin to voluntarily submit to the EIS any actual annual greenhouse gas (GHG) emissions of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) that are available from permitted facilities.

The NEI consists of air pollutant emissions data from the following five data categories:

- Point sources
- Nonpoint sources
- Onroad sources
- Nonroad sources
- Event sources

Point sources are stationary sources of quantifiable air pollutant emissions. Any stationary source that has emissions that equal or exceed any of the following thresholds is defined to be a point source:

- Potential emissions of 1,000 tons/yr for CO
- Potential emissions of 100 tons/yr for primary $PM_{2.5}$, primary PM_{10}, NO_X, SO_2, VOCs, or NH_3
- Actual emissions of 0.5 ton/yr for lead and lead compounds

The Bureau, however, will continue to voluntarily treat all permitted facilities as point sources, with the exception of gasoline dispensing facilities, dry cleaning services (NAICS Code 812320), and automotive body, paint, and repair shops (NAICS Code 811121). Airports and rail yards are also classified as point sources.

Stationary sources of air pollution that are not inventoried as point sources are considered to be *nonpoint sources*. They are typically too small or too numerous to inventory individually, so emissions from these sources are estimated collectively at the county level by their SCC. Some of the sources within this broad data category are agricultural activities, gasoline dispensing facilities, certain categories of fuel combustion equipment, certain facilities that use solvents (e.g., dry cleaning services), and dust from roads and construction. Furthermore, commercial marine vessels, locomotives, and aircraft are also categorized as nonpoint sources even though they are mobile sources.

Onroad sources are mobile sources of air pollution that encompass motor vehicles that travel on public roads. Automobiles, trucks, motorcycles, and buses are included in this data category. Onroad sources are grouped by SCC, and emissions from them are estimated by using county-level inputs to a computer model.

Mobile sources of air pollution that are not classified as onroad or nonpoint sources are considered to be *nonroad sources*. This data category includes off-road vehicles, construction equipment, and lawn and garden equipment. Emissions from nonroad sources, grouped by SCC, are also estimated at the county level through the use a computer model.

Event sources consist of large wild fires and prescribed fires. Air pollutant emissions from these sources are specified by the day that the fire event occurred.

Air pollutant emissions data is required to be submitted annually by air agencies to the EIS for point sources that have potential emissions that equal or exceed any of the following thresholds:

- 2,500 tons/yr for NO_X, SO_2, or CO
- 250 tons/yr for primary $PM_{2.5}$, primary PM_{10}, VOCs, or NH_3

Currently, only one source within Hamilton County meets a threshold for annual reporting of air pollutant emissions data. This source is Volkswagen Group of America Chattanooga Operations, LLC, which has potential VOC emissions in excess of 250 tons/yr.

Air pollutant emissions data is required to be submitted triennially by air agencies to the EIS for all sources, with the exception that agencies may choose to accept emission estimates that are provided by the EPA for specified sources. Future triennial NEI reporting years are 2017, 2020, 2023, etc.

3.1 Point Sources

Prior to submitting air pollutant emissions data for point sources to the EIS, all required corresponding facility information must be present in the Facility Inventory, which is accessed by way of the EIS Gateway website. The Facility Inventory consists of the following four levels:

- Facility site
- Emission units
- Processes
- Release points (both stack and fugitive)

Each facility must be linked to at least one emission unit, each emission unit must be linked to at least one process, and each process must be linked to at least one release point. Furthermore, multiple processes may be linked to the same release point.

All of the required information for the Facility Inventory is contained within the Bureau Emissions Inventory, which is arranged into three levels: *company*, *certificates*, and *process components*.

The company level of the Bureau Emissions Inventory is analogous to the facility site level of the Facility Inventory, the certificates level corresponds to the emission units level, and the process components level contains information for both the processes and release points levels. The Facility Inventory must be updated to include all relevant changes that have occurred in the Bureau Emissions Inventory since point source emissions data was last submitted to the EIS. These changes would include any facility and emission unit additions, SCC updates, release point parameter revisions, and geographic coordinate adjustments.

Air pollutant emissions data is extracted from the Bureau Emissions Inventory into Excel spreadsheets that are in the required "staging table" format. An EIS "bridge" tool is then used to convert this information into the required XML file format for submittal, within a zipped folder, to the EIS through the CDX.

The Bureau will continue to accept EPA air pollutant emission estimates for the six airports (including heliports) and three rail yards within Hamilton County. These facilities are not permitted by the Bureau, but are accounted for in the Facility Inventory. Acceptance of these estimates is accomplished by making a "support request" through the EIS Gateway website.

3.2 Nonpoint Sources

A Nonpoint Survey, which is available through the EIS Gateway website, must be completed by air agencies for each triennial NEI reporting year. The purpose of the Nonpoint Survey is to indicate which nonpoint source categories, grouped by SCC, are to rely upon air pollutant emission estimates that are provided by the EPA. For each such category, EPA estimates would not be used either if emissions data for the category is submitted by the air agency or if no sources that are included in the category exist within the air agency's jurisdiction. Emissions data for a category of the Nonpoint Survey that is submitted by an air agency can be identified with that nonpoint source category, with one or more point sources, or with both.

Air pollutant emissions data for certain nonpoint source categories can be estimated by air agencies using database tools that are supplied by the EPA. The two most useful and inclusive of these tools are for industrial, commercial, and institutional (ICI) fuel combustion equipment and for solvent use processes. Output files from these database tools are in the staging table format. Emissions data in these files is modified, as necessary, to exclude emissions for any nonpoint source category that are being accounted for, in whole or in part, under one or more point sources, so as to avoid double counting. In the absence of a database tool, emissions data for nonpoint source categories can be directly input into a staging table. The emissions for a nonpoint source category are set at zero if all corresponding emissions are reported, in whole, under one or more point sources.

The EIS bridge tool is used to convert air pollutant emissions data for nonpoint source categories, at the county level, from the staging table format into the required XML file format. This data is then submitted within a zipped folder to the EIS through the CDX.

The Bureau will continue to accept EPA air pollutant emission estimates for the nonpoint source categories that include commercial marine vessels and locomotives. The Bureau will also accept any EPA estimates for emissions from aircraft in transit that are included in nonpoint source categories. Acceptance of these estimates is done through the EIS Gateway website by making a support request.

3.3 Onroad and Nonroad Sources

Air pollutant emissions from all onroad and nonroad source categories are calculated by the EPA using the most recent version of the Motor Vehicle Emission Simulator (MOVES) computer model. Air agencies are to submit only county-level inputs for the MOVES model to the EIS, not actual emission estimates. Alternatively, agencies may choose to accept MOVES model inputs (and the resulting emission estimates) that are provided by the EPA for onroad sources, nonroad sources, or both.

The Bureau will continue to submit MOVES model inputs for onroad sources to the EIS if they are available and appropriate. Such inputs for Hamilton County were provided to the Bureau by the Tennessee Department of Environment and Conservation (TDEC) for the 2014 reporting year. They were jointly developed by the Tennessee Department of Transportation (TDOT) and the University of Tennessee.

Submittal of MOVES model inputs for onroad sources is performed by first compiling the input data into county database (CDB) tables. These are saved into a properly named folder, which is put into a zipped folder. This zipped folder is then stored, along with three required documents, into a second zipped folder, which is placed with yet another required document into a final zipped folder. The completed package is submitted to the EIS by way of the CDX. The required contents of the four supporting documents and the required naming conventions to use for all of the documents and folders are detailed in an EPA document that gives specific instructions for submitting onroad source model inputs for the triennial NEI reporting year.

The Bureau will continue to accept EPA inputs to the MOVES model for nonroad sources. Acceptance of EPA model inputs, for onroad or nonroad sources, is carried out by submitting a support request via the EIS Gateway website.

3.4 Event Sources

The EPA estimates air pollutant emissions from all large wildfires and prescribed fires for which they have necessary fire activity data. A primary source of this information for the EPA is satellite imagery. Air agencies are not required to submit emissions data for any of these events, but are requested to submit any available activity data for fire events that are missing or found to have been misrepresented. Activity data includes fire type, start and end dates, geographic coordinates, acres burned, fuel loading, and fuel consumption. Any such activity data can be submitted directly by email to an EPA contact person for event sources who is designated by the EPA for the triennial NEI reporting year.

4.0 QUALITY OBJECTIVES AND CRITERIA

Facilities having sources of air pollution that are required to be permitted by the Ordinance are classified in the Bureau Emissions Inventory as true minor, synthetic minor, or major, as defined in the Ordinance. An installation permit must be applied for by the facility and issued by the Bureau for any emissions source, for which permitting is required, prior to the construction or modification of such source. An initial certificate of operation, valid for up to the first year of operation, is required to be applied for by the facility and issued by the Bureau for a new or newly modified emissions source at any facility that is categorized as true minor or synthetic minor before such a source can be operated. It is necessary that a Part 70 (Title V) permit be applied for by the facility and issued by the Bureau for the operation of emission sources at any facility identified as major. Certificates of operation and Part 70 permits are renewed as required.

Information for a facility that is initially entered into the Bureau Emissions Inventory is obtained from an installation permit application package that is submitted by the facility. This package includes supplemental permitting forms that specify data such as release point parameters, pollutant control efficiencies, and potential air pollutant emission estimates. Permitting personnel of the Bureau Engineering Department evaluate this information in order to write a detailed report that discusses the proposed installation or modification, the resulting emissions, and applicable local and federal regulations. This installation permit report also includes recommendations to the Bureau Director regarding both installation permit issuance and specific pollutant emission limitations, as applicable. Furthermore, an initial inspection of process equipment and any associated control equipment of a new or newly modified emissions source is conducted by permitting personnel prior to issuance of an initial certificate of operation for the source in order to verify that equipment was installed or modified in accordance with the installation permit application package.

Bureau permitting personnel strive to perform an inspection and full compliance evaluation of each permitted facility, for which they have been assigned, on an annual basis. The purpose of

the inspections is to observe the condition and operation of process and control equipment of air pollution sources in order to determine if the equipment continues to be configured and operated as required by the conditions of either applicable certificates of operation or a Part 70 permit. Release points are also observed to quantify the opacity of visible emissions, if warranted, and pertinent operating parameters are recorded. The evaluations include reviews of both onsite records and periodic compliance reports submitted by the facility, as applicable. Examples of information that can be in these records and reports are material receipts, fuel usages, operating hours, control equipment operating parameters, material-balance calculations of emissions, continuous emission monitoring results, and deviations from required operating parameters. The results of each facility inspection and associated evaluation are presented in a written report that also includes discussions of equipment operation, current and potential emissions, and applicable regulations. Relevant information, including emissions data, from the inspection and evaluation findings is then updated into the Bureau Emissions Inventory.

The permitting process functions to continually improve the quality and accuracy of data in the Bureau Emissions Inventory. Physical inspections of process equipment, control equipment, and release points serve to expand understanding of operations and to reveal any changes since previous inspections. Information in onsite records and in permitting forms and compliance reports that are submitted by permitted facilities is examined by Bureau permitting personnel for correctness and consistency.

An emissions test of a source may be required by a local or federal regulation or may otherwise be deemed necessary by the Bureau Director in order to determine if air pollutant emission limitations are being met or to establish required control equipment operating parameters. The conditions under which such a test is to be conducted are specified in a written emissions pre-test agreement that is developed by Bureau permitting personnel with input from both the facility and the testing company. Permitting personnel observe the test to confirm that both test and process procedures are performed in accordance with the pre-test agreement and to ensure that appropriate process parameters are recorded for each test run. Permitting personnel also verify the test results, including emission calculations, which are presented in a test report that is prepared by the testing company. Emissions data, based on the most recent valid emissions test for a source, is entered into the Bureau Emissions Inventory in place of any previous data.

Geographic coordinates are given as Universal Transverse Mercator (UTM) coordinates in the Bureau Emissions Inventory, but must be reported as latitude and longitude decimal degrees in the Facility Inventory. The conversion between the two measurement systems requires several equations and is performed using a computer program algorithm. Coordinates for older facilities and for certain release points within these facilities were originally obtained by Bureau permitting personnel using a handheld global positioning system (GPS) receiver. Permitting personnel now determine needed coordinates more accurately by locating facilities or release points on an online map that uses satellite imagery and aerial photography. Permitting personnel continue to confirm and update coordinates in both the Bureau Emissions Inventory

and Facility Inventory by using the online map and the measurement system conversion program.

5.0 SPECIAL TRAINING

The Engineering Manager, two Engineers, and Associate Engineer of the Bureau Engineering Department have each been employed by the Bureau in air pollution permitting for at least ten years. They are all well qualified and experienced in the work of permitting and in maintaining the Bureau Emissions Inventory. All of the permitting personnel maintain certification in the evaluation of visible emissions, which they renew every six months, and they each have a valid Tennessee driver license. All of them have taken and continue to take relevant courses through the Air Pollution Training Institute (APTI). The Engineering Manager attends periodic air permitting workshops that are coordinated by EPA Region 4. Furthermore, the two Engineers each have an Engineer in Training (EIT) certification, and the Engineering Manager is registered as a Professional Engineer in Tennessee.

6.0 DOCUMENTATION AND RECORDS

Paper copies of all installation permits, certificates of operation, and Part 70 permits for permitted facilities are maintained at the Bureau offices. Supplemental permitting forms, compliance reports, correspondence, emission test reports, diagrams of process and control equipment, and other pertinent information submitted by the permitted facilities are also maintained at the Bureau. Installation permit reports, annual inspection and full compliance evaluation reports, and emissions pre-test agreements that are written by permitting personnel of the Bureau Engineering Department and the Emissions Inventory Quality Assurance Project Plan are all kept at the Bureau as well. All of these documents and records are maintained in perpetuity in filing cabinets, with the exception of those for facilities that are permanently closed. Documents and records for permanently closed facilities are maintained for at least seven years from the date of closure. Electronic copies of Bureau generated reports are also available.

The Bureau Emissions Inventory is an Oracle database. It is archived for each calendar year and maintained in perpetuity. The earliest archived year is 1999. The current year and all archived years of the Bureau Emissions Inventory are accessed through an electronic file server, which is "backed up" on approximately a monthly basis with the backup files retained offsite.

7.0 QUALITY CONTROL

Air pollutant emissions data for both point sources and nonpoint sources and MOVES model inputs for onroad sources are all submitted by way of the CDX to two different "environments"

within the EIS. Emissions or model input data is first sent to the EIS *quality assurance (QA)* environment. The EPA responds by email with a feedback report on the submittal after a short time. This report is also available at the EIS Gateway website. The feedback report indicates any errors in the submittal that would prevent it from being processed and any warnings, such as "outlier" data that is not within an expected range. Possible errors include missing required data, incorrect data format, invalid pollutant code, and invalid SCC. All errors must be corrected and all warnings must be addressed with applicable data corrected, as needed.

The emissions or model input data is resubmitted to the EIS QA environment if any corrections have been made. After a submittal to the QA environment results in a feedback report with no errors or unresolved warnings, the same submittal is then sent to the EIS *production* environment for processing. This will also result in a feedback report that should be free of errors and unresolved warnings.

8.0 DATA SOURCES

The primary source of data for air pollutant emissions from point sources is a comprehensive EPA document titled *AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources.* AP-42 is divided into fifteen chapters, each covering a different broad emissions source type. It is available online, and sections within each chapter are individually revised and updated. Emission factors are presented for distinct processes within each section. Each of these pollutant-specific factors is multiplied by a specified activity rate (e.g., tons of grain received per day, gallons of No. 2 fuel oil burned per year, or number of batteries produced per hour) to arrive at either a controlled or an uncontrolled emissions rate. A pollutant control efficiency, typically supplied by the control equipment manufacturer, is applied to any resulting uncontrolled emissions rate for which the emissions are controlled. Emission equations are also sometimes given in sections of AP-42, such as the equation, which incorporates the ideal gas law, for working losses from fixed roof tanks. Furthermore, emissions from tanks that are used for organic liquids storage can be calculated by using the most recent version of the TANKS computer program, which utilizes AP-42 emission equations, physical constants for specific chemicals, and meteorological values for particular locations. Details of how emission factors and equations are arrived at are included in background documents that are available for most of the AP-42 sections.

Additional sources of air pollutant emissions, emission factors, and emission equations include other EPA documents, such as *Protocol for Equipment Leak Emission Estimates*; the Tier 1 Methodology for Calculating GHG Emissions from General Stationary Fuel Combustion Sources (Title 40 *Code of Federal Regulations* Part 98, Subpart C, §98.33); large air agencies, such as the South Coast Air Quality Management District (SCAQMD) in California; research institutes, such as the National Council for Air and Stream Improvement (NCASI), which serves the forest products industry; manufacturers of process or control equipment; and permitted facilities.

Emission factors from manufacturers can be in the form of a guarantee [e.g., NO_X emissions from an engine will not exceed 0.6 gram per horsepower hour or $PM_{2.5}$ emissions from a high-efficiency particulate air (HEPA) filter will not exceed 0.0003 grain per dry standard cubic foot]. Facilities sometimes develop emission factors that are applicable to operation at full production from analyses of bench-scale operations that are performed in a laboratory.

Safety data sheets and environmental data sheets are valuable sources of information for calculating air pollutant emissions, in particular those resulting from the application of coatings. These sheets are developed for specific materials by manufacturers and are available from permitted facilities. Information useful for emission calculations, such as material density, VOC content, solids content, and contents of individual HAPs, is typically found on these sheets. If a needed value is not listed or is given only as a broad range on a data sheet, it can usually be obtained from the manufacturer's technical support personnel using contact information provided on the sheet.

Material balance calculations are very useful for determining emissions of an air pollutant that is used within a process but that is not chemically changed by the process. The use of a material as a non-reacting solvent is an example. This method requires accounting for the amounts of applicable material received, accumulated, retained in the product and byproducts, and shipped out in waste streams over a given time period.

Air pollutant emissions from a point source can be directly measured either by conducting an emissions test or by using a continuous emission monitoring system (CEMS). An emissions test provides emissions information that is representative of the conditions under which the test was conducted. Emissions from a source at a facility can sometimes be estimated by using information from an emissions test report for a similar emissions source, located either at the same facility or elsewhere.

Process activity rates, for use with air pollutant emission factors, can be rates of material receipt, material usage, fuel consumption, production, etc. Sources for this kind of information, available from the permitted facility, include material delivery records, material usage logs, purchase orders, inventory records, fuel meter reading records, fuel bills, production records, emission calculation spreadsheets, and facility compliance reports. In addition, process operating hours can be used to effectively arrive at emission rates for emissions that are consistent over time. They can be obtained from records of equipment hour meter readings, operating time logs, or facility knowledge of number of shifts worked and amount of down time.

9.0 DATA MANAGEMENT

Air pollutant emission factors from applicable sections of AP-42 are checked by permitting personnel of the Bureau Engineering Department to ensure that the latest available factor that is

appropriate for a particular emissions source is being used. Furthermore, information presented in AP-42 background documents is used on occasion to refine AP-42 emission factors for specific processes.

Physical constants for additional chemicals, such as gasoline with a different Reid vapor pressure (RVP), can be added to the chemical database of the TANKS computer program. Also, local values in the TANKS meteorological database can be adjusted to account for a heated, cooled, or indoor tank. In addition, a computational error in the latest version of the TANKS program determines vapor pressures that are too high for the colder months and too low for the warmer months. However, this can be compensated for by calculating emissions for each calendar month separately using monthly local meteorological values. A turnover (saturation) factor is calculated for use in reducing emissions resulting from the AP-42 working loss equation for fixed roof tanks whenever the annual volume of material loaded into such a tank exceeds thirty-six times its capacity.

The Tier 1 Methodology for Calculating GHG Emissions lists global warming potentials for specific air pollutants and CO_2 emission factors for various fuels. Several of these values have been revised since the Tier 1 methodology began to be used, so Bureau permitting personnel verify the use of the correct values. In addition, heat contents for natural gas and No. 2 fuel oil that are given in the Tier 1 methodology for calculating GHG emissions differ from those that are specified by applicable AP-42 sections for calculating emissions of other pollutants.

The most recent safety data sheets and environmental data sheets, as indicated by their revision date, are used to obtain information for determining air pollutant emissions. Bureau files are checked by Bureau permitting personnel for the latest data sheets submitted from facilities, and copies of any newly revised data sheets are requested during facility inspections. Data sheets are obtained from the facility for any proposed new or replacement coatings or other pertinent materials, and they are evaluated by permitting personnel to assure that any applicable content limitations will be met. Permitting personnel also verify that applicable information from data sheets is transferred correctly to any facility emission calculation spreadsheets that make use of it.

An emissions test report for a source should include at least one relevant process parameter that was measured during each test run so that the air pollutant emission results can be expressed as an emissions factor that incorporates an appropriate activity rate. Older test reports often do not include such a parameter, in which case the emission test results may be rendered useless for the current operation of the source. In addition, older test reports for sources of particulate matter emissions typically only include results for the filterable particulate matter component. Emissions of condensable particulate matter, arrived at by using AP-42 or another data source that might be available, are added to the $PM_{2.5}$ and PM_{10} emissions in the Bureau Emissions Inventory for such an emissions source. All fuel combustion equipment

results in condensable particulate matter emissions, and all condensable particulate matter is both $PM_{2.5}$ and PM_{10}.

Bureau permitting personnel review facility compliance reports and air pollutant emission calculation spreadsheets to match process activity rate information presented in them with the records from which the data originated. Facilities are normally required to keep such records onsite and available for inspection for five years.

10.0 ASSESSMENTS AND RESPONSE ACTIONS

Permitting personnel of the Bureau Engineering Department assess sources of air pollutant emissions, emission factors, and emission equations that are available for each emission source to ensure that the most accurate and appropriate data source is being used for each emitted pollutant. These assessments are initially performed as a part of the evaluation of installation permit application packages. They continue to be done in conjunction with the annual inspections and associated full compliance evaluations of permitted facilities as new or revised information becomes available.

Air pollutant emissions data in the Bureau Emissions Inventory is reviewed for consistency with the annual inspection and full compliance evaluation reports by Bureau permitting personnel prior to the submittal of data to the EIS. They also confirm that the data is valid for the current NEI reporting year and not held over from a previous year.

Bureau permitting personnel and the Engineering Manager assess air pollutant emissions data in the Bureau Emissions Inventory to assure that actual annual emissions from individual sources are not underreported in the Bureau Emissions Inventory and subsequent submittals to the EIS. For example, PM_{10} emissions from a source cannot be less than $PM_{2.5}$ emissions from the source, and VOC emissions from a source cannot be less than the sum of all of the source's volatile organic HAP emissions, excluding non-VOC HAPs (e.g., methylene chloride and perchloroethylene). They also verify that such emissions are not over reported by substantiating the use of actual rather than potential operating hours and, in the case of fuel combustion equipment, the use of average heat inputs or actual fuel usages rather than rated heat input capacities.

11.0 REPORTS TO MANAGEMENT

All installation permit reports and annual inspection and full compliance evaluation reports for permitted facilities are reviewed initially by the Bureau Engineering Manager and then by the Bureau Director. Any requested clarifications or corrections are made to the reports by the responsible permitting personnel of the Bureau Engineering Department. Subsequent follow-up

inspections are conducted if the Director determines that they are warranted. Emissions pre-test agreements are also assessed by both the Engineering Manager and Director.

12.0 DATA REVIEW, VERIFICATION, AND VALIDATION

After all submittals of air pollutant emissions data have been made to the EIS for a given data category (e.g., point sources) and the time allotted for such submittals has ended, the EPA notifies the Bureau by email of any suspected errors with the submittals that involve data completeness or outlier data. Any such errors are addressed by permitting personnel of the Bureau Engineering Department. If corrections are made to any of the data, the Bureau makes a request, by email, that the CDX be made available for submitting the corrected data to the EIS. The submittal is then made as before, first to the QA environment and then to the production environment when the resulting feedback report indicates that there are no errors or unresolved warnings.

The EPA releases the draft version of the NEI for the triennial reporting year following their preliminary evaluation of the air pollutant emissions data submittals. It is available by way of the EIS Gateway website. The Engineering Manager reviews NEI data for Hamilton County and then contacts the EPA on a case-by-case basis concerning the resolution of any possible omissions or other errors that are found.

13.0 VERIFICATION AND VALIDATION METHODS

Permitting personnel of the Bureau Engineering Department evaluate each suspected error that is disclosed by the EPA in their initial assessment of the air pollutant emissions data submittals. The original submittal is examined to see if any data that is noted as being missing was included in it, and the EPA is notified about resubmitting the data if this is the case. Any data that was inadvertently overlooked is added. Outlier data is evaluated by examining the data source (e.g., an AP-42 emission factor) and other relevant information that were used to arrive at the emissions data in question. This information can include an activity rate (e.g., material usage rate), pollutant control efficiency, and operating hours. Pertinent data records are inspected if necessary. If an error is identified that resulted in the suspect data not being within the expected range, it is corrected. The EPA is notified if, after a thorough review, the data is believed to be correct and is much outside of the expected range.

Significant portions, pertaining to Hamilton County, of the draft version of the NEI for the triennial reporting year are checked by the Engineering Manager to verify that expected air pollutant emissions data is present. NEI data can be accessed through the Facility Inventory for each permitted facility, with the exception of those that are treated as nonpoint sources. The remaining NEI data can be searched by data category, sector (e.g., gasoline dispensing facilities), and SCC.

14.0 RECONCILIATION WITH USER REQUIREMENTS

The Bureau Emissions Inventory is continually revised and updated by the permitting personnel and Engineering Manager of the Bureau Engineering Department. It is maintained for the air pollution permitting work of the Bureau and is the primary source of data for periodic submittals of air pollutant emissions data to the EIS, which is used by the EPA to create an NEI for each triennial reporting year.